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A HANDBOOK

ON THE

PREVENTION OF TUBERCULOSIS

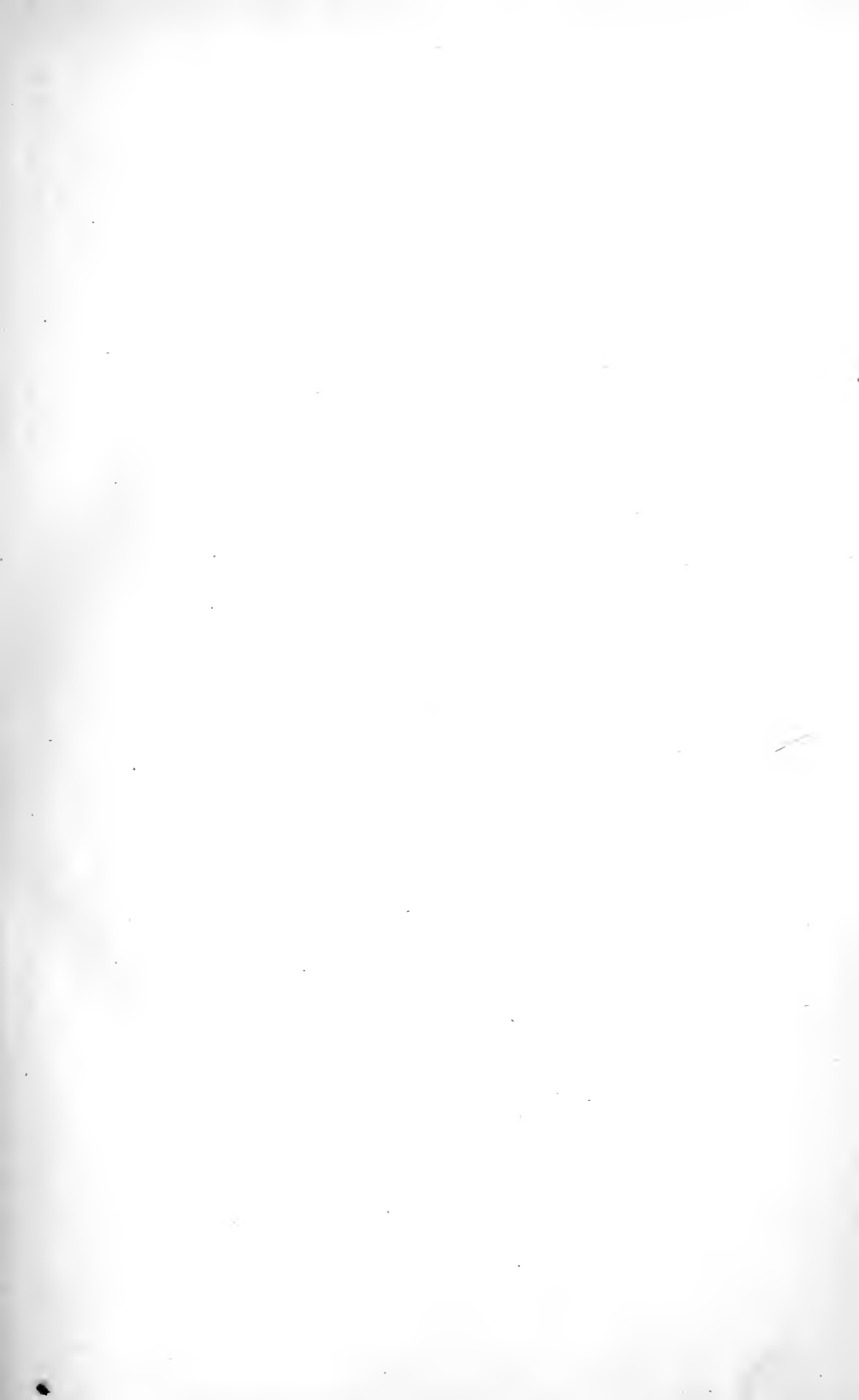
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A HANDBOOK  
ON THE  
PREVENTION OF TUBERCULOSIS

BEING THE FIRST ANNUAL REPORT  
OF THE  
COMMITTEE ON THE PREVENTION OF  
TUBERCULOSIS  
OF  
THE CHARITY ORGANIZATION SOCIETY  
OF THE CITY OF NEW YORK

---

PUBLISHED BY  
THE CHARITY ORGANIZATION SOCIETY  
NEW YORK CITY

1903

The Knickerbocker Press  
(G. P. PUTNAM'S SONS)  
New York

# THE COMMITTEE ON THE PREVENTION OF TUBERCULOSIS

OF

THE CHARITY ORGANIZATION SOCIETY  
OF THE CITY OF NEW YORK

---

CHARLES F. COX, *Chairman*

OTTO T. BANNARD

HERMANN M. BIGGS, M. D.

HERBERT S. BROWN

JOSEPH D. BRYANT, M. D.

MISS ELLA MABEL CLARK

ROBERT W. DE FOREST

EDWARD T. DEVINE

HOMER FOLKS

FRANKLIN H. GIDDINGS

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A. JACOBI, M. D.

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MISS A. B. JENNINGS

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T. MITCHELL PRUDDEN, M. D.

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W. G. THOMPSON, M. D.

E. L. TRUDEAU, M. D.

FRED'K L. WACHENHEIM, M. D.

R. C. W. WADSWORTH

MISS LILLIAN D. WALD

MISS LILIAN BRANDT, Statistician

PAUL KENNADAY, Secretary

105 East 22d Street, New York City



## PREFACE

THIS Handbook on the Prevention of Tuberculosis is a contribution of the New York Charity Organization Society towards the world-wide movement to put an end to the most deadly and most needless scourge with which humanity is afflicted. It is inspired by a confident hope in the success of this movement. Relief for the individual consumptive, abundance of plain and suitable food, uncontaminated air in living and sleeping rooms, the provision of sanatoria, dispensaries, nurses, and physicians for those who are sick and who cannot themselves pay for these necessities, are among the means to this end.

The Committee on the Prevention of Tuberculosis, whose first annual report is included in this volume, seeks to co-ordinate the various agencies at work in this field, and to promote appropriate action by state, municipality, private institutions and individual citizens. It is needful to allay baseless fears of harm from the mere proximity of consumptives who are instructed and conscientious. The Committee aims to diminish, not to increase, the hardships of those who are ill; but it insists that it is the duty of the community to give them a chance to get well while they are curable, and to isolate such as, through persistent carelessness or for other reasons, are really a source of danger to their fellows.

It is hoped that the handbook will be of service, not only in New York City, but to those who are organizing similar movements elsewhere. There are indications that in many communities conditions exist similar to those which led to the

formation of this Committee. The demand for information concerning its origin, scope, and methods of work has led the Committee to include, with this first annual report, not only a review of the year, but as much as possible of the material prepared under the auspices of the Committee, whether for lectures or for publication. Some of this material has previously been published in *Charities*, the *Annals of the American Academy of Political and Social Science*, *Harper's Monthly*, and *The New York Medical Record*; and acknowledgment is made of the courtesy of the publishers of those periodicals in permitting its reproduction.



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# REVIEW OF THE FIRST YEAR: 1902-3



## REVIEW OF THE FIRST YEAR: 1902-3

THE Committee on the Prevention of Tuberculosis, appointed by the Charity Organization Society, held its first meeting on Monday afternoon, June 16, 1902, at the office of the Society, for the purpose of organization. The scope and general plans of the Committee were at that time outlined, and the work of carrying them out was begun the following September.

The considerations and circumstances leading to the appointment of this Committee and the basis on which it began its work were stated in the twentieth annual report of the Charity Organization Society, as follows:

“Just at the close of the year covered by the present report, the Central Council initiated a movement which may prove to be of more importance than any other in which the Society has participated in recent years. This was the appointment of the Committee on the Prevention of Tuberculosis, consisting of sixteen representative physicians and sixteen others who are especially interested in the social aspect of the disease. In many respects the methods of work adopted by the new Committee will be similar to those which were employed in the case of the Tenement House Committee. Like the former committee, this one will be representative in character. For example, both Dr. Ernst J. Lederle, Commissioner of Health, and Dr. Hermann M. Biggs, medical officer of the Health Department; Mr. Homer Folks, Commissioner of Public Charities, and Mr. Robert W. de Forest, President of the Charity Organization Society and Commissioner of the Tenement

House Department, are members of the Committee. Co-operation will be sought not only with charitable agencies of all kinds, but with city departments and State officials. Attention will be devoted to educational propaganda and the support of the public press will be especially sought.

"The services of a competent secretary, a district nurse, and a statistician, who will devote their entire time to the Committee, have been secured, and at the same time, in so far as it will be of advantage, the entire volunteer body of workers and the expert agents and visitors of the Society will contribute to the objects which it is desired to accomplish.

"The first task will be an exhaustive investigation of some of the social aspects of tuberculosis. There are already in progress in many laboratories investigations of a bacteriological character; and in the hospitals and sanatoria there is opportunity for clinical study and investigation into the physical aspects of the disease. Little attempt, however, has been made to establish the relation, for example, between infected living apartments and the victims of the disease; or into the possibility of recovery or improvement resulting from improved diet and improved light and air, when patients are treated in their own homes; nor has there been any systematic effort to ascertain how far infection can be prevented by instruction in the nature of the disease and in the character of the precautions which should be taken to prevent its spread. In several foreign countries and in some parts of the United States, as well as in Canada, there have been organized societies for the prevention of tuberculosis, their chief functions being the dissemination of leaflets and of information in other forms concerning the communicability of the disease, the disinfecting of apartments where deaths have occurred, and the necessity of conscientious care on the part of consumptives, especially as to the danger of spitting in hallways, public conveyances, or on the street. Educational and practical work of this kind is of the utmost importance, and the Committee will undertake to carry on such work on a large scale at the same time that its investigations are in progress.

“In co-operation with relief agencies it is hoped that much additional information may be obtained concerning the desirability of making an entire change in the physical environment of those who are suffering from the disease, even when this involves considerable financial outlay. The financial burden imposed by the existence of 20,000 consumptives in New York City is enormous, and on the financial side alone, therefore, it may be found a good investment to cure tuberculosis in its incipient stages, rather than to allow almost the entire number, as at present, to become a burden either upon their immediate family or upon the public in the last stages of the disease.

“The Committee wish especially to emphasize the fact that this movement is not in any sense one against consumptives, nor one that will be permitted in any way to increase the already great hardships of their lot. In some quarters there is a tendency to exaggerate the danger of casual contact with tuberculous patients. It is believed that there is no occasion for any panic or public apprehension from the existence in a community of consumptive patients, provided a reasonable degree of prudence is exercised. Complete isolation of all consumptives would be an utterly impracticable proposition. Undue restraint upon the liberty of patients in moving from one place to another, or any such general dread of the disease as will make it more difficult for those who have had tuberculosis but have been cured, or for those who are improving and are conscientious in caring for their own sputum, thus preventing the infection of others, to find employment, is to be deprecated. The ruling of the immigration authorities that all consumptives would be excluded on the ground that their disease is dangerously contagious is an instance of action of this kind. Only six intending immigrants were, however, excluded under this ruling between January 1, 1902, and August 31, 1902, obviously much less than the number arriving. The total number of persons returned to foreign countries in this period who were afflicted by tuberculosis was twenty-six, but twenty were brought to the Commissioner from various places

for deportation under the one-year clause, *i. e.*, because they had become public dependents within one year of their arrival. A systematic attempt to spread accurate information concerning what is definitely known about the disease will be of benefit to individual consumptives, and will eventually, it is hoped, contribute to the lessening of the present high death-rate from the disease.

“The present Committee is not the first attempt that has been made to perfect an organization of this kind, and one of the most hopeful things in connection with its formation is that the earlier attempts in the same direction are merged into it. Last winter, largely upon the initiative of Dr. S. A. Knopf, a call was circulated for a meeting to form a society for the purpose of fighting tuberculosis. Many of those who have now become members of the new Committee signed this call. Owing to the difficulty of finding a layman with the proper qualifications for the position of president of the society, the formation of the society was not consummated and the physicians who have been interested in the matter have cordially endorsed the present plan by which the executive and clerical work of the Committee will be attended to in the offices of the Charity Organization Society, while the scientific and professional guidance required will be supplied by those who are competent to give it.

“Aside from the investigation above described in the social aspects of tuberculosis, the objects of the Committee have been formulated in part as follows:

“I. The promulgation of the doctrine that tuberculosis is a communicable, preventable, and curable disease.

“II. The dissemination of knowledge concerning the means and methods to be adopted for the prevention of tuberculosis.

“III. The advancement of movements to provide special hospitals, sanatoria, and dispensary facilities for consumptive adults and scrofulous and tuberculous children among the poor.

“IV. The initiation and encouragement of measures which tend to prevent the development of scrofula and other forms of tubercular diseases.”



On September 15, an appeal for funds was issued, embodying a statement of the objects of the Committee. This appeal read as follows:

"The Charity Organization Society's Committee on Tuberculosis needs not less than \$10,000 to meet the expenses of the work which it has undertaken. Contributions made to the Society for its usual current operations should not be reduced and cannot be diverted in any large amount to the purposes of this special Committee. The expenditures to be made by the Committee will be for the following main objects:

"1. Research into the social, as distinct from the medical, aspects of tuberculosis: for example, into the relations between the disease and overcrowding, infected tenements and unhealthy occupations, and also into the influence upon recovery of improved diet and hygienic living.

"2. Education. The publication of leaflets and pamphlets, the giving of lectures, and the promulgation in every possible way of the fact that tuberculosis is a communicable and preventable disease; the widest distribution of the results of scientific research in this field, and of the results of modern treatment both in sanatoria and at home.

"3. The encouragement of movements for suitable public and private sanatoria both for advanced and for incipient cases; for adults and for children; for free care and also for the care of those who can pay moderate fees.

"4. The relief of indigent consumptives by the provision of suitable food and medicines, by the payment of rent when this is necessary to secure adequate light and air, and by transportation and maintenance at a distance, when, in the judgment of the Committee, this is essential.

"The labors of the Committee will be directed not only towards the amelioration of the condition of the large class of consumptives, but also towards the benefit of the community as a whole, in which there is encouraging reason to believe that tuberculosis may be practically eradicated. The work of the Committee is not intended to be temporary merely, but its

continuance and effectiveness will depend upon the public encouragement and support received.

“For research and publication the Committee can easily make use of the \$10,000 asked for, and could employ a larger sum to good purpose. In the relief of special cases existing agencies will be asked to co-operate, but any funds which individuals may be willing to supply for this special purpose will lessen the burden upon organizations which are already overtaxed by cases of need arising in large numbers from the class of consumptive poor.”

The work of the Committee has been carried on along the lines laid down in this prospectus.

#### I.—RESEARCH INTO THE SOCIAL ASPECTS OF TUBERCULOSIS.

The results of this part of the work are presented in one of the appendices to this report (Appendix 1). All available statistics in the United States Census and in the reports of the New York City Department of Health have been studied. By the courtesy of the registrar and other officials of the Department of Health, all of the records there have been opened to us and they have afforded much valuable material. This investigation into the social aspects of the disease, made by the statistician of the Committee, Miss Lilian Brandt, has formed the basis for a series of articles in *Charities*, a paper in the May (1903) issue of the *Annals of the American Academy of Political and Social Science*, several newspaper articles, and a lecture before the Summer School in Philanthropic Work.

A schedule (Appendix 2) was framed early in the year calling for a comparatively full social history of cases of consumption. It is being used at the Phthisis Infirmary on Blackwell's Island and, with some modifications, at Vanderbilt Clinic. Similar records are being kept also at several other institutions in regard to cases from the tenement districts of Manhattan. Altogether they will afford material for a more detailed social study than has ever been made.

The account by Commissioner Folks of the conditions of

life from which the men in the Phthisis Infirmary come (Appendix 3) is based on the first of these records collected by the Phthisis Infirmary.

## II.—EDUCATION.

The education of the public in regard to the nature of the disease and the precautions which should be taken to prevent its spread has been undertaken by means of lectures and literature.

The lectures were given by members of the Committee or physicians recommended by the Committee. The total number for the winter was eighty-one, with an aggregate attendance of 8700. The list of places in which the lectures took place (Appendix 4), including as it does settlements, churches, mothers' clubs, young men's associations, public schools, and Teachers College, and the number of languages in which they were given—English, Yiddish, Italian, French, and German,—are evidence of the variety in the audiences.

Several courses of lectures were arranged. One was delivered in the Assembly Hall of the United Charities Building, and was designed especially for practical social workers. The program was as follows:

November 10, 8 P.M.—Germs of Consumption: What they are and what they do. Dr. J. H. Huddleston. Appendix 5.

December 8, 8 P.M.—Causation and Prevention. Dr. H. M. Biggs. Appendix 6.

February 9, 8 P.M.—The Duties of the Government and the Individual in the Combat of Tuberculosis. Dr. S. A. Knopf. Appendix 7.

March 9, 8 P.M.—Tuberculosis and Children. Dr. A. Jacobi. Appendix 8.

April 13, 8 P.M.—Sanatoria and Climatic Influences. Dr. Henry P. Loomis. Appendix 9.

Another course, of four lectures, was arranged for the West Side Branch of the Young Men's Christian Association; still another, of three, for the East Side Janitors' Association.

Co-operation with the Board of Education resulted in thirteen of its twenty-seven lectures on the subject of tuberculosis being given by physicians from the Committee's list.

Many of the lectures were illustrated by stereopticon views and in general the interest aroused was gratifying.

It is significant that in the Summer School of Philanthropic Work the subject of tuberculosis was considered of sufficient importance to be allotted two days out of the brief six weeks of its duration. The first of the two lectures was given by Dr. S. A. Knopf, and dealt with "What the Charity Worker should Know of the Treatment and Prevention of Tuberculosis." On the second day Miss Brandt spoke of the "Social Factors in the Prevalence of Consumption."

The work of education has also been carried on through the distribution of literature. Six thousand copies of the four-page leaflet *Warfare against Consumption* (Appendix 11) have been distributed, mainly in connection with the lectures; the House of Refuge on Randall's Island received seven hundred. It thus reached chiefly a tenement-house population. Nine thousand copies of Dr. Biggs's pamphlet, *Tuberculosis—Its Causation and Prevention* (Appendix 6), have been distributed among the public libraries, the insurance companies, and the larger railroad offices. The essay by Dr. Prudden (Appendix 10) has been distributed among the school teachers of Manhattan and the Bronx.

A circular of *Information for Consumptives and those Living with them* (Appendix 12) was issued by the Department of Health in the spring and fifty thousand copies of it turned over to this Committee for distribution. This circular is designed primarily for tenement dwellers. The English bears on the obverse a translation in German or Yiddish or Italian. Of the fifty thousand copies, about nineteen thousand were distributed during the summer through day nurseries, kindergartens, the industrial schools of the Children's Aid Society, employment bureaus, settlements, branches of the public library, and relief societies.

Five thousand copies of Dr. Knopf's lecture, *The Duties of*

*the Individual and the Government in the Combat of Tuberculosis* (Appendix 7), are ready now for distribution. The lecture given by Dr. Jacobi on *Tuberculosis and Children* (Appendix 8) is about to be reprinted from *Charities* and distributed. Two sets of plans for a Municipal Sanatorium and Commissioner Folks's report to the Board of Estimate and Apportionment, which will be spoken of later, have also been printed in pamphlet form, one thousand of each (Appendices 13, 14, 15). Five thousand copies of Mr. Poole's descriptive pamphlet, *The Plague in its Stronghold* (Appendix 16), have just come from the press and will doubtless do much to make the public realize the sufferings brought on the poor by this preventable disease.

Finally, a second appeal for funds has been drawn up, setting forth a number of definite objects for which money is needed, and this is now ready to be sent out.

Expressions of interest in the Committee's work have come from many sources. Letters of inquiry have been received from various parts of the country requesting copies of the publications of the Committee. Some come from State commissions and societies working for the same ends as this Committee; others tell piteous stories of sons or husbands sinking under the disease and beg us, if we have any sure cure, to send it at once. Still others read something like this: "Dear Firm, I saw your ad in the evening paper a few days ago and would like to know more about it." The "ad" proves to be a quotation from the Health Department circular to the effect that more information may be obtained either there or at this office.

One part of its educational work the Committee was fairly forced into by the daring expedients of the "sure cure" concerns. Several of them so juggled with utterances of members of the Committee and with statements of the purposes of the Committee as to create the impression that their specifics had the sanction of the Committee and of the Charity Organization Society. The following expression of opinion on this point was accordingly published, over the signatures of the entire Committee:

*"Whereas*, It has come to the knowledge of the Committee on Tuberculosis of the Charity Organization Society that many so-called specific medicines and special methods of cure for tuberculosis have been and are being exploited and widely advertised, and

*"Whereas*, The advertisements of some of these cures have made such reference to the Tuberculosis Committee of the Charity Organization Society, or to some of its members, as to create the inference that this Committee, or its members, recommend or advocate the use of many such so-called specifics or special methods of cure for pulmonary tuberculosis, or consumption, and

*"Whereas*, There is no specific medicine for this disease known, and the so-called cures and specifics and special methods of treatment widely advertised in the daily papers are in the opinion of the Committee without special value, and do not at all justify the extravagant claims made for them, and serve chiefly to enrich the promoters at the expense of the poor and frequently ignorant or credulous consumptives, Therefore,

*"Resolved*, That a public announcement be made that it is the unanimous opinion of the members of this Committee that there exists no specific medicine for the treatment of pulmonary tuberculosis, and that no cure can be expected from any kind of medicine or method except the regularly accepted treatment which relies mainly upon pure air and nourishing food."

Five thousand copies of this warning were issued. They have been sent to all the clergymen in New York City, to every daily, weekly, and monthly paper published in the city, to all registered nurses, to all charitable societies, to the secretaries of every county medical society in the State of New York, and to all the medical societies in Greater New York. Copies have also accompanied each package of pamphlets sent to offices and schools.

The library of the Charity Organization Society contains a number of pamphlets and books on the subject, particularly its social aspects. A large number of clippings from papers

all over the country has been accumulated, bearing on the work of the Committee and on similar work elsewhere.

A bibliography of some of the most important works on tuberculosis, in English, French, and German, has been selected by Dr. S. A. Knopf from the mass of such literature, and is presented in Appendix 20.

### III.—REMEDIAL AND PREVENTIVE MEASURES.

*Dispensaries and Sanatoria.*—At the beginning of the year's work a survey was made of existing provisions for the treatment of poor consumptives in New York City (Appendix 18). Their inadequacy led the Committee to direct a considerable part of its efforts towards investigating and encouraging movements for increasing dispensary facilities and sanatorium accommodations.

A year ago Dr. Russell's class for consumptives at the Post-Graduate Hospital, the class at St. Bartholomew's Clinic, and the Dispensary class of the New York Nose and Throat Hospital were the only satisfactory attempts being made to provide proper dispensary treatment for ambulant cases. In January a special class for consumptives was instituted at Vanderbilt Clinic, under the direction of Dr. James A. Miller (Appendix 17). A building for a municipal dispensary is now being erected on the lot adjoining the building of the Department of Health on the south, and the expectation is that it will be opened in January, 1904.

The possibilities of the dispensary in dealing with the tuberculosis problem cannot be exaggerated. That the dispensaries of the city, with two or three exceptions, do not realize their opportunities is a fact to be deplored,—and faced. With a view to stimulating interest in this part of the situation, all the larger dispensaries were visited by representatives of the Committee, who consulted with the officials in regard to the possibility of special treatment for consumptives. Later the presidents of the boards of managers of all the dispensaries in the city were invited to send delegates to a conference to be

held in the United Charities Building to discuss the advisability of establishing special classes for tuberculous patients, one for adults, and another for children, in the dispensaries. The meeting was held on March 31.

The work now being done at Vanderbilt Clinic is indicative of the tremendous force latent in machinery already existing, which could be developed at comparatively slight expense. Its success has led to the initiation of similar work at Mt. Sinai Dispensary in New York, at the Yale Dispensary in New Haven, and at still another in Rochester, and classes are to be organized soon by Dr. Miller at Bellevue, Harlem, and Gouverneur Hospitals in New York City.

The activity of the Committee in relation to hospital and sanatorium provision has been threefold.

When the appropriation for completing the State Hospital at Raybrook was under consideration, and it was uncertain whether the revenues of the State would bear the expenditure of the full amount, the following letter was addressed to the Governor:

" April 22, 1903.

"HON. B. B. ODELL, JR., Governor,  
"Albany, N. Y.

"SIR:

"On behalf of the Charity Organization Society's Committee on the Prevention of Tuberculosis, I am authorized to write, earnestly asking executive approval of the appropriation by the Legislature of \$115,000 for the completion of the State Hospital for Incipient Cases of Tuberculosis.

"The need of this institution is very great. Its usefulness at present and in the immediate future, in view of the widespread interest in the prevention of tuberculosis and the public determination to make such measures effective, will be incalculable. The delays in the selection of the site and the erection and opening of the hospital since its establishment was first determined upon, are most unfortunate; and it will be doubly unfortunate if less than the full amount requisite to complete and make the buildings available should not be approved.



"I am requested by the Committee to express, in the strongest possible manner, their hope that you will be able to approve the appropriation as passed by the Legislature.

"Respectfully yours,

"(Signed) EDWARD T. DEVINE,

"General Secretary,

"Charity Organization Society."

By the approval later of the appropriation in full the danger of any further delay that might have arisen through lack of funds was averted.

In January a sub-committee was appointed to confer with the city Department of Health, to urge plans for the erection of a municipal sanatorium and to offer co-operation in regard to ways and means. Two sets of plans for such a sanatorium were prepared for the Committee, one by Messrs. Renwick, Aspinwall, & Owen, the other by Messrs. Howells & Stokes (Appendices 13 and 14).

The popular sentiment aroused by the discussion in the daily press and elsewhere in regard to the necessity for a municipal sanatorium finally found expression in resolutions adopted by the Board of Aldermen on April 14 calling on the Commissioner of Charities to prepare a report on the subject. All the pertinent material in the hands of the Committee, including both sets of plans, were at once put at the Commissioner's disposal. In his report of July 15, to the Board of Estimate and Apportionment, he submitted copies of both sets of sketches, together with the explanatory letters of the architects, as "suggestions of the general character of buildings now favored for such purposes."

The third way in which the Committee sought to use its influence in the interests of sanatorium and hospital provision was by protesting and arousing protests from various other organizations and individuals against the Goodsell-Bedell bill, a bill which has been accurately described as one "to discourage provision for poor persons suffering from pulmonary tuberculosis." The bill, which has since become a law, read as follows:

"A hospital, camp, or other establishment for the treatment of patients suffering from the disease known as pulmonary tuberculosis shall not be established in any town by any person, association, corporation, or municipality, unless the board of supervisors of the county and the town board of the town shall each adopt a resolution authorizing the establishment thereof, and describing the limits of the locality in which the same may be established."

The protest of the Committee, as such, was first voiced in the following letter to the Governor:

"April 22, 1903.

"HON. B. B. ODELL, JR., Governor,  
"Capitol, Albany, N. Y.

"SIR:

"I am authorized by our Committee on the Prevention of Tuberculosis earnestly to request your disapproval of the Goodsell-Bedell bill (Assembly Int. No. 1247, entitled 'An Act to Amend the Public Health Law in Relation to the Establishment of Public Hospitals or Camps for the Treatment of Pulmonary Tuberculosis'), requiring the consent of township and county authorities for the establishment of any sanatorium for consumptives which, under authority of Chapter 327 of the Laws of 1900, might be erected by a city of the first class outside the city limits.

"Under the act above mentioned, it is necessary to secure the consent of the State Board of Health to the selection of any such site, and, in addition, it is provided that the institution, when erected, shall be under the supervision and oversight of the local Board of Health. To require in addition that both township and county authorities shall give their consent is, of course, to make the establishment of any such sanatorium as is contemplated by the act of 1900 practically impossible. Private property rights are sufficiently protected by general laws, and the process of injunction is open, in case it can be positively shown that unwarranted injury would be inflicted by the establishment of a hospital on a particular site. The necessity of obtaining the consent of the State Board of Health

is ample guarantee that a site shall not be selected which will threaten or unduly expose the health of any particular neighborhood. The law already provides that the hospital cannot be erected within the incorporated limits of any city or village.

"Our Committee on the Prevention of Tuberculosis, having in mind all these existing safeguards, most earnestly protests against adding such burdensome conditions as are imposed by this bill, and invites your consideration of the urgent need of additional sanatoria—public and private, State and municipal—a need so great that those who interpose needless obstacles to meeting it incur the gravest responsibility. The Board of Aldermen of the City of New York last week unanimously passed resolutions calling upon the Commissioner of Public Charities to make an estimate of the cost of providing a hospital with sufficient accommodations to care for all indigent consumptives in the city. This is only one more evidence of the growing recognition of the necessity for public action in meeting the scourge of tuberculosis. The State of New York has many localities which, in elevation and in climatic condition, are ideal sites for such institution, and which are not sufficiently near any considerable body of people to be in any sense a public nuisance. To close all of these sites to the city of New York except on condition of securing the consent of at least three, and possibly four, independent bodies, would be an act of such gross injustice and so contrary to sound public policy that we confidently rely upon your preventing its consummation.

"I need not say that our opposition to this measure is not founded upon any desire upon our part to see a hospital established on any particular site, such as the site at Central Valley, which has been so much discussed in the press and elsewhere.

"I have the honor to be, with great respect,

"Yours very truly,

"(Signed) EDWARD T. DEVINE,

"General Secretary,

"Charity Organization Society."

Later, on April 30, a request was preferred for a public hearing on the bill, in this letter:

' April 30, 1903.

"HON. B. B. ODELL, JR., Governor,

"State Capitol, Albany, N. Y.

"SIR:

"Unless, on the receipt of this letter, you have already decided not to give your approval to the bill amending the health law by adding to it a section to be known as Sec. 218a, requiring town and county consents to the erection of any sanatorium, hospital, or camp for the care of consumptive patients, this Committee requests that a public hearing be given on the subject. There are many persons and charitable agencies who are opposed to this legislation and would like an opportunity to express their views, in case there is a probability that the bill will be approved.

"As most of the persons who are most actively interested in this matter will be in attendance on the National Conference of Charities and Correction at Atlanta, May 6 to 12, we should like to have this hearing not earlier than May 15, and would prefer that it should be not earlier than May 20, as there are some who will not be able to return before that date.

"Respectfully yours,

"(Signed) EDWARD T. DEVINE."

The hearing was not arranged.

Finally, the arguments of the first letter were re-enforced as follows:

" May 15, 1903.

"HON. B. B. ODELL, JR., Governor,

"Capitol, Albany, N. Y.

"SIR:

"On April 22 I wrote you, at the request of our Committee on the Prevention of Tuberculosis, in reference to the Goodsell-Bedell bill entitled 'An Act to Amend the Public Health Law in Relation to the Establishment of Public Hospitals or Camps for the Treatment of Tuberculosis.' In that letter attention was called especially to the effect of this proposed

legislation in limiting, if not practically destroying, the power conferred on cities of the first class by Chapter 327 of the Laws of 1900, authorizing them to establish sanatoria outside the city limits. The bill, however, goes far beyond this, and would equally interfere with any hospital, camp, or sanatorium which might otherwise be erected by a private philanthropist, a fraternal society, or any other association or corporation.

"At the very time when private philanthropy is disposed increasingly to make some provisions for the prevention of the scourge of tuberculosis, a measure is brought forward which might accurately be termed a bill to discourage private or public action in the relief of sufferers from tuberculosis.

"Experience has shown that in the neighborhood of sanatoria of this kind the prevalence of the disease and the number of deaths from it are actually less than in other communities. The rigid discipline which it is possible to maintain in and about institutions of this kind, and the educational work which it undertakes, are a sufficient explanation. To assume that the health of the entire county is at stake or is in any way threatened by the establishment of a sanatorium, is the height of absurdity; and it is almost equally absurd to anticipate that conditions throughout the township will be changed unfavorably by the selection of a site for a sanatorium within its limits.

"Our Committee has not taken action adverse to the principle that in some appropriate manner local opinion should be considered in the selection of a site for either a public or private sanatorium; the State Board of Health might appropriately be given a veto power, if, on petition from the locality affected, it is shown that injury is likely to result. To pass a law, however, placing upon town and county authorities the duty of deciding whether or not a sanatorium is to be created, is to do incalculable mischief by the effect of such a law upon public opinion. The very existence of such a statute suggests that adverse action by the county or township authorities is called for. What county or township board would be so unpatriotic or so recreant to the interests of local property holders as to give consent to the selection of a site for a sanatorium, when

there is no interest demanding it except that of humanity, and no reason for favorable action except the quixotic desire to lessen the number of needless deaths and to stamp out disease?

"The measure is so sweeping and places so great obstacles in the way of effective care for a large class of the sick who are not and probably cannot be admitted to general hospitals, that we respectfully urge that it be not approved.

"Sincerely yours,

"(Signed) EDWARD T. DEVINE."

In spite of these efforts and equally vigorous expressions of opinion from various members of the medical profession all over the State and from many charitable agencies, the bill became a law. To secure the use of any site for a New York City sanatorium, therefore, it will be necessary to obtain the consent, after it has been chosen by the Board of Health of this city, of the Town Board, the County Board of Supervisors, the State Board of Health, and presumably the local Board of Health. It remains to be seen whether this multiplication of the consents required will hamper movements for sanatoria as much as has been feared.

*Relief Work.*—In October, 1902, the families in which consumption was the main cause of dependence and which had been under the care of the Charity Organization Society through its eleven District Committees, were all transferred to the care of the Committee on the Prevention of Tuberculosis, who, through a sub-committee on Treatment, endeavored to supervise and obtain relief for these cases scattered throughout the whole of the boroughs of Manhattan and the Bronx. With little variation, it was the same story in each case—the chief bread-winner, out of work, at last giving way to the consumption which had been making work for him more and more difficult, even while it made wages which might buy necessary food and decent lodgings more than ever essential; in the last stages of his disease or when it had secured such a hold on him that nothing but careful nursing and prolonged rest could retard the inevitable result, coming to this Committee and asking

for rent and coal and special diet ; often going to the dispensary and taking advice on proper precautions to be observed, but only rarely going to the hospitals, where alone any permanent improvement might be expected. Up to April, two hundred and eleven families came under the supervision of the sub-committee and its agent and four visitors, at which time the relief provided amounted to about one thousand dollars a month. For reasons of internal administration, it seemed better to turn this work again into the hands of the regular district committees and their agents and thus to draw, to a greater extent than was possible for one central committee, on various local and personal sources of relief. The Committee on the Prevention of Tuberculosis since that date has not taken direct responsibility for the relief of particular cases, but is placing at the disposal of district committees whatever information it can secure as an aid in their treatment of the families in which there is one or more tuberculous patients and in which relief is required.

*Protest against Proposed Changes in the Tenement House Law.*—When modifications of the Tenement House Law were threatened which would have been a direct menace to the health of the tenement dwellers, the Committee did what it could to aid in preventing the changes. The following resolutions were adopted and a copy forwarded to the chairman and each member of the Senate and the Assembly Committee on Cities:

“*Whereas*, There are now pending in the Legislature at Albany a number of bills to amend the Tenement House Law, and

“*Whereas*, None of these bills are designed to strengthen the Law and to provide additional safeguards for the health and welfare of tenants, and

“*Whereas*, Their enactment would be one of the most serious backward steps that have ever been taken in the housing of the working people, Therefore be it

“*Resolved*, That the Committee on the Prevention of Tuberculosis is directly and fundamentally concerned in the defeat

of these measures; that the Committee is earnestly opposed to any amendment of the Tenement House Law that will reduce the amount of light and air available for the occupants of tenements, whether in new or in old buildings. Be it further

*“Resolved,* That the Committee is especially opposed to any modification of the Law which will permit dark and semi-dark bedrooms in new houses, or will permit a return to the old narrow, dark, unventilated air-shaft in the construction of new houses; or any change in the Law that will remove from the protection of the present Law, houses which are now, by the terms of the Law, included within its provisions. And be it further

*“Resolved,* That the active assistance of all who wish to check the ravages of tuberculosis in its various forms is asked in defeating any bills for the amendment of the Tenement House Law.”

Fortunately public opinion was sufficiently strong on the same side to prevent the proposed amendments from becoming law.

#### PLANS FOR THE YEAR 1903-4.

The work of the Committee for the second year will proceed along the same general lines. A repetition of its fundamental principles and a statement of the most urgent needs of the city at this stage of the movement to check tuberculosis are embodied in the second appeal for funds, which reads as follows:

“In order to check the ravages of consumption in New York City, concerted action by the government, by the medical profession, relief agencies, and private citizens is necessary. A municipal sanatorium for patients in the early stages of the disease and a municipal dispensary are required. Steps have already been taken toward meeting these needs, but the movements should be advanced as rapidly as possible and should be heartily encouraged by all organs of public opinion. Further provision by the city for the exclusive treatment of consump-



tives in the later stages of the disease is urgently needed, although considerable progress has been made in this direction. The earliest possible completion of the State hospital for incipient cases, at Raybrook, should also be urged. These are the most obvious undertakings for the State and city governments. They leave much responsibility with the individual members of society.

“Among the special needs which will have to be supplied chiefly by private initiative, the Committee on the Prevention of Tuberculosis places emphasis at the present time on the following:

“1. Private sanatoria should be provided for patients who can afford to pay a moderate amount, and they should also be endowed sufficiently to provide for absolutely free treatment in exceptional cases. Such provision as is now made in the Adirondack Cottage Sanatorium, the Loomis Sanatorium, Bedford Branch of Montefiore Home, Gabriel's Sanatorium, the Stony Wold Sanatorium, Seton Hospital, and St. Joseph's Hospital, should be increased either by the creation of new institutions or by adding to the facilities of those already in existence.

“2. Relief funds should be supplied for the relief of indigent consumptives in their own homes until sanatorium or hospital accommodations are provided, and for patients who, on competent medical advice, can safely and with advantage to themselves and their neighbors be treated at home. For such patients special diet is essential, including ample quantities of milk and eggs and such medicines as may be prescribed. It is often essential, also, to remove the family into lighter and better ventilated rooms, and for this purpose provision for the payment of rent is sometimes necessary.

“3. There are some instances in which the payment of board in private families outside the city is advisable, and relief funds should be provided for this purpose, especially in the interval pending the enlargement of sanatorium and hospital accommodations.

“4. Special dispensaries or clinics for the treatment of

patients living at home are desirable. The presence of persons suffering from various forms of tuberculosis in general dispensaries is objectionable in the interests both of themselves and of other patients. Beginnings have already been made in this direction, and the Health Department is about to open a special dispensary, but if funds are provided to meet the expense, several additional dispensaries would make special provision of this kind, and the out-patient treatment at the dispensary should be supplemented by the provision of special diet, when necessary, and by district nursing.

"5. Seaside sanatoria for scrofulous and tuberculous children are also needed, to which teachers should be attached, so that the intellectual development of the children need not suffer.

"6. An agricultural colony is desirable, where cured patients discharged from the sanatoria may find out-door employment for a time. They will thus be better prepared to re-enter their former occupations and in some instances may have learned to like farm-work and will not wish to return to the overcrowded city. A horticultural colony might be established with the same point in view.

"7. The education of the public in the means of prevention, and in those facts concerning the cure and treatment of the disease which are of interest and of value to the general public, is one of the essentials to the stamping out of the disease. Public lectures by physicians, the distribution of leaflets prepared by expert authorities, and research into the social aspects of the disease, have been undertaken by the Committee on the Prevention of Tuberculosis, and funds are required to carry forward these undertakings.

"Contributions to meet any of the above needs may be made through the Committee on the Prevention of Tuberculosis. Careful attention will be given to any requests for advice or suggestions from any who are willing to aid this movement in whatever manner."

# FINANCIAL REPORT FOR THE YEAR ENDING JUNE 30, 1903

## RECEIPTS

Balance on hand June 30, 1902.....	\$ 700.00	
Contributions and subscriptions .....	<u>7,355.00</u>	\$8,055.00

## DISBURSEMENTS

Salaries and wages.....	\$3,024.64	
Printing and stationery.....	774.92	
Postage.....	262.00	
Illustrating lectures.....	147.10	
Outfit.....	52.00	
Medical supplies.....	66.37	
Petty expenses.....	<u>243.85</u>	<u>\$4,570.88</u>
Balance on hand June 30, 1903.....		\$3,484.12

# CONTRIBUTIONS FOR GENERAL WORK OF THE COMMITTEE ON THE PREVENTION OF TUBERCULOSIS

JULY, 1902, TO JUNE, 1903

Adrianse, Harris Ely.....	\$ 10.00	Beckhard, M.....	\$20.00
Aldrich, Mrs. James Herman	10.00	Beekman, Dr. J. N.....	10.00
Aldrich, William P.....	10.00	Bloomingdale, J. B.....	25.00
Amend, Bernard G.....	25.00	Boissevain & Co.....	25.00
Anonymous:		Bonner, George T.....	20.00
A Friend.....	1,000.00	Brewster, Mrs. Benj.....	100.00
" J. M.".....	5.00	Brewster, Robert S.....	100.00
" H. G. K.".....	25.00	Buchtenkirch, Herman.....	10.00
" I. B. C.".....	2.00	Calhoun, Henry W... ..	50.00
" H. D. H.".....	2.00	Carter, Jas. C.....	10.00
Archbold, John D.....	50.00	Clark, Miss Ella Mabel .....	25.00
Arnold, Constable, & Co....	100.00	Claudwell, Mrs. Wm. A....	25.00
Avery, Samuel P.....	50.00	Claudwell, Dr. Charles M...	25.00
Bannard, Otto T.....	100.00	Cochran, W. Bourke.....	50.00
Baylis, Miss Mary.....	25.00	Cole, Mrs. Hugh L.....	10.00

Colgate, William.....	\$20.00	Kohnstamm, Emil V.....	\$50.00
Comstock, Mr. and Mrs.		Koven, L. O., & Brother....	10.00
Albert .....	20.00	Krotel, Rev. G. F., D.D....	10.00
Congdon, H. L.....	5.00	Laidlaw, Jas. L.....	100.00
Conger, Henry C.....	10.00	Lawrence, Cyrus J.....	10.00
Cox, Chas. F.....	100.00	Lazarus, Mrs. Amelia B....	10.00
Cravath, Mrs. Paul D.....	10.00	Lee, Mrs. Frederic S.....	50.00
Davis, Mr. and Mrs. Gherardi	50.00	Leeds, Mrs. William B.....	50.00
Dench, Dr. Edward B.....	10.00	Lisman, F. J.....	50.00
DeVinne, Theo. L.....	10.00	Loomis, Dr. Henry P.....	25.00
DeWitt, George G.....	25.00	McMahon, M. T.....	10.00
Drummond, Mrs. Jas. F....	5.00	McKesson, John, Jr.....	100.00
Durkee, E. R., & Co.....	10.00	McKinn, John A.....	25.00
Eidlitz, Marc, & Son.....	25.00	MacLaren, Mrs. F.....	10.00
Eidlitz, Otto M.....	10.00	Manierre & Manierre .....	5.00
Ellis, George W.....	10.00	Mason, William.....	10.00
Fahnestock, H. C.....	100.00	Martin, Mrs. John.....	5.00
Fischer, B., & Co.....	25.00	Metropolitan Tobacco Co....	25.00
Frothingham, H. P.....	10.00	Milliken, E. F.....	25.00
Goddard, J. W., & Sons....	50.00	Moore & Schley.....	25.00
Goldenkranz, Dr. S.....	5.00	Morgan, Miss Caroline L....	100.00
Gottheil, Paul.....	25.00	Munn, Charles A.....	5.00
Gurnee, A. C.....	10.00	Munn, O. D.....	20.00
Gutta - Percha and Rubber		Oelrichs & Co.....	50.00
Mfg Co.....	25.00	Ogden, Robert C.....	25.00
Hall, Mrs. John H., Sr....	10.00	Olyphant, J. Kensett .....	10.00
Harkness, Edward S.....	50.00	Oppenheimer, Dr. Henry S..	10.00
Harkness, Mrs. S. V.....	50.00	Park & Tilford.....	100.00
Head, Charles, & Co.....	25.00	Parsons, John E.....	20.00
Hearn, Arthur H.....	25.00	Passavant & Co.....	10.00
Heimann & Lichten.....	10.00	Peaslee, Dr. Edward H....	10.00
Henderson, Miss Mary W...	5.00	Penfold, William Hall.....	50.00
Herrman, Mrs. Esther.....	10.00	Pinkerton, Robert A.....	10.00
Hoyt, Mrs. Colgate.....	10.00	Poel, F.....	50.00
Hubbard, Thos. H.....	50.00	Price, Mrs. J. M.....	5.00
Humphreys, Alex. C.....	10.00	Prosser, Thos., & Son.....	25.00
Hyatt, A. M.....	15.00	Rand, Charles F.....	10.00
Isham, Samuel .....	10.00	Rathbone, R. C.....	25.00
Isham, Wm. B.....	25.00	Read, William A.....	50.00
Isham, Mrs. Wm. B.....	25.00	Redmond, Miss Emily .....	20.00
James, Dr. Walter B.....	50.00	Redmond, G. H.....	25.00
Jennings, Frederic B.....	50.00	Ripley, Louis A.....	10.00
Jennings, Mrs. Walter.....	200.00	Robertson, Albert.....	10.00
Kaufman, Irma L.....	1.00	Rockefeller, John D.....	1,500.00
Kemey, Mrs. Walter S....	10.00	Rogers, Edward L.....	25.00
Kennedy, William L.....	10.00	Rubino, Jacob.....	100.00

Sachs, Mrs. Samuel.....	\$10.00	Thompson, Mrs. Walter L....	\$20.00
Sackett, Henry W.....	5.00	Thorne, W. V. S.....	10.00
Schenck, Miss A. H.....	10.00	Tiemann, Julius W.....	5.00
<sup>1</sup> Schermerhorn, Wm. C.....	250.00	Tiffany & Co.....	50.00
Schiff, Jacob H.....	250.00	Van Winkle, Miss Mary D...	10.00
Schiff, Mortimer L.....	100.00	Wadsworth, C. S.....	10.00
Seligman, Isaac N.....	100.00	Wasserman Bros.....	100.00
Sidenberg, G.....	10.00	Watson, Porter, Giles, & Co.	10.00
Sloan, Benson B.....	10.00	Webb, Mrs. H. Walter.....	10.00
Smith, Henry A.....	5.00	Weed, Benj.....	10.00
Solomon, Henry.....	10.00	Weinberg, Perry A.....	5.00
Sommers, Miss Clara.....	5.00	Wetmore, Charles W.....	25.00
Starr, Dr. M. Allen.....	25.00	Wetmore, Dr. John McE....	5.00
Stein, Mrs. A.....	10.00	Wheeler, Everett P.....	5.00
Sternbach, Charles.....	25.00	White, G. B.....	10.00
Stetson, Francis Lynde.....	50.00	Whitehouse, Mrs. J. H.....	10.00
Strauss, Frederick.....	10.00	Whitely, James.....	25.00
Tappin, Mrs. John C.....	5.00	Willcox, William G.....	25.00
Tesla, Nikola.....	25.00	Wills, Charles T.....	25.00
Thacher, Alfred B.....	10.00	Wurts, Pierre J.....	5.00
Thacher, Thos.....	25.00	Younker, Herman.....	10.00

#### CONTRIBUTIONS FOR RELIEF WORK

Anonymous :		Duryee, Miss Alice .....	\$5.00
In memory of Graham		Fitch, Miss Lucy A.....	5.00
M. Leupp .....	\$100.00	Hickson, Miss J.....	1.00
" M." .....	5.00	Higgins, Mrs. Arthur S....	5.00
" A. W. M." .....	2.00	Hunter, Miss Anna F.....	1.00
Cash.....	2.00	Lederer, Miss.....	10.00
Cash.....	.50	McKinn, LeRoy.....	5.00
Almond, Mr. and Mrs. T. R.	10.00	Miller, Miss Sarah M.....	5.00
Benjamin, John .....	10.00	Morgan, Geo. F.....	1,000.00
Bloodgood, J. H.....	50.00	Robertson, Albert.....	25.00
Close, Miss F. H.....	7.00	Shumand, Miss L. F.....	3.00
Cram, Miss E. L.....	15.00	Stone, Miss Annie.....	500.00
Dexter, Henry .....	100.00	Warburton, F. J.....	100.00

<sup>1</sup> Deceased.



APPENDIX I

THE SOCIAL ASPECTS OF  
TUBERCULOSIS  
BASED ON A STUDY OF STATISTICS

By LILIAN BRANDT





# THE SOCIAL ASPECTS OF TUBERCULOSIS BASED ON A STUDY OF STATISTICS

## I

### PURPOSE OF THE STATISTICAL INVESTIGATION

WHEN a British traveller, some decades since, wrote to a Turkish host, after his return home, asking for some figures about the population and industries of the town he had visited, he was told that the thing he asked was "both difficult and useless." The Turk saw in the occasion, also, a fitting moment for a general criticism, from the serene heights of Islam philosophy, of the disposition of the European mind to inquire into matters which concern it not. "Shall we say," he asked his friend, by way of illustrating the curiosity he deprecated, "Behold, this star spinneth around this other star, and this other star, with a tail, cometh and goeth in so many years? Let it go. He from whose hand it came will direct and guide it."

The incident has a double application to a study of tuberculosis based on statistics. There are not lacking among us objectors to the statistical method of increasing knowledge on the ground that it is "both difficult and useless," and until recently the popular attitude toward tuberculosis has been analogous to that of the Turkish letter-writer toward the transactions of the heavenly bodies.

It is only twenty years since the revelations of the microscope despoiled us of our justification for maintaining this Oriental habit of mind on the subject of tuberculosis. The

establishment of the fact that consumption is not hereditary has taken it out of the list of things about which inquiry is unprofitable; the demonstration that it is curable and preventable has put it into the list of evils for which man can no longer on any plausible pretext shirk a share of responsibility.

In regard to the statistical method, we agree with the Turk that it is "difficult," but we deny that it is "useless." Probably an imperfect realization of its difficulty has prevented its value from being recognized. For it must be admitted that the illegitimate use often made of it, either by the guileless who have faith in the tradition that figures are incapable of deception, or by the unscrupulous who exploit for their own ends the common acceptance of this tradition, is enough to warrant its being discredited. The statistical method has its limitations, but it has also its value. It might be said that the latter is directly proportional to the clearness with which its limitations are defined.

It is the purpose of this report to make available for application to the problem of preventing tuberculosis the statistics which reveal its social relations. To this end only such statistics are presented as are pertinent to the practical issue; in compiling the tables the aim has been to make them no more numerous or complicated than is compatible with giving all the data essential to an understanding of their significance; the most important tables have been translated into diagrams or maps in the hope that the graphic form may prove readable to "those who run"; the accompanying text is an attempt to state what the statistics show and what they do not show; finally, some suggestions are made for the practical use of the facts established by the figures.

It will be seen from the analysis of the statistics that tuberculosis is of social significance. It is a social problem in several senses. The position it holds at the head of the column of death-dealing diseases makes it a matter of grave concern to all members of society; its prevalence depends largely on social conditions; in turn it aggravates social evils; and its practical eradication rests with social activity.

## II

### IMPORTANCE OF CONSUMPTION AS A CAUSE OF DEATH

The statement that consumption causes more deaths than any other disease has been so freely used for emphasizing the necessity of doing something about it that this item has doubtless become common property. One-tenth of all deaths in the United States are due to this cause; in the large cities the proportion ranges from seven to fifteen per cent.

It is less generally known that this pre-eminence of consumption is being vigorously contested by pneumonia, with the prospect that the next Federal Census will see the title of "Captain of the Men of Death" transferred to the aspiring rival. The Census of 1900 showed that, while for the whole United States, as has been said, consumption was still in the lead, in the "registration area"<sup>1</sup> it had already dropped behind. How far this change in relative position is due to inaccurate reporting of the cause of death cannot be measured. The conviction is not to be escaped that some part of the mortality due to consumption is attributed to pneumonia and bronchitis. Paradoxically enough, it is in the "registration area," where the vital statistics are on the whole more reliable than for the country at large, that this particular error is most likely to exist.

Under ordinary circumstances, where there is no consideration which would make it less desirable that one disease should

<sup>1</sup> In the presentation of results in the Federal Census those States and cities whose registration records gave evidence of being the most nearly complete were classed together as the registration area. The total population of the registration area amounted to thirty-eight per cent of the population of the United States. It comprised the States of Connecticut, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and the District of Columbia, and included so many of the important cities throughout the country that it may be considered fairly typical. It is probable that the superior accuracy of the returns from this area makes them ordinarily more truly indicative of the country as a whole than are the defective returns given for the whole United States.

be assigned as a cause of death than another, the probability is that the importance of consumption in the mortality records is exaggerated. Any illness accompanied by the well-known signs of consumption, emaciation and a cough, if it is not clearly something else, is naturally believed to be this familiar disease; and it may well be that in those parts of the country where competent medical judgment is limited in supply, the number of deaths due to consumption is over-stated.

In the registration area, not only is this source of error eliminated by the higher average and more plentiful distribution of medical knowledge, but there exist considerations which tend to bring the registration of deaths from consumption below their actual number. There are doctors, in cities where inspection and disinfection are the rule after a death from tuberculosis, who can be persuaded to report the death as due to chronic bronchitis or pneumonia, in order that the family may be saved the discomfort of an enforcement of the regulation. Presumably they justify to themselves their mis-statement of the fact and their evasion of a desirable sanitary requirement, by seeing personally that the proper precautions are taken and the necessary renovation done. Another circumstance which has still more influence in this direction is the practice of some small mutual-benefit societies, to refuse to pay claims when the death is due to tuberculosis.<sup>1</sup> It is not strange that to the physician in such cases the accuracy of vital statistics often seems a remote concern by comparison with the immediate needs of the family in which he is interested. The ethics of the question does not allow of debate, but it is of less interest in this connection than the practical result that the importance of consumption as a cause of mortality in the registration area is not fully represented by the figures.

As neither this error nor the one which affects in the opposite direction the records in the more sparsely settled parts of the country is susceptible of mathematical measurement, it would be indiscreet to venture an estimate as to how far they

<sup>1</sup> This is not true of any of the large industrial insurance companies, though the impression that it is may be met with.

supplement each other. It is safe to say that in the combined figures for the whole country the tendency to under-statement in the registration area and the tendency to exaggeration in the non-registration area must to some extent counteract each other, so that on this particular point of the proportion of deaths due to consumption, the percentage for the country at large is probably nearer the truth than that for either of its divisions. Pneumonia, moreover, as a cause of death, represents many different types of infection—not a single one as is the case with tuberculosis. Different cases of pneumonia show different changes in the lungs and are caused by different kinds of bacteria. The resemblance often rests solely in the organ of the body attacked. The name stands, therefore, for a group of diseases rather than for a single one.

It will be seen, also, a little farther on, that the importance of tuberculosis as a social phenomenon does not rest wholly, nor even chiefly, on its claim, now likely to be more and more disputed, of causing the largest number of deaths, but rather on the discrimination with which it selects its victims and on its intimate causal relation to many social problems. The passing of its day of glory at the head of the list of causes of death will not relieve society of reasons for concern.

### III

#### SOCIAL FACTORS IN THE PREVALENCE OF TUBERCULOSIS

There is no feature in the composition of a population which does not affect the prevalence of consumption. The natural characteristics of age and sex and the proportions of married and single, are of no less importance in explaining the death-rate from this cause in any locality than are the more artificial factors of density of population, housing conditions, occupation, and social customs. These factors form a complexus so intimate that it would be unprofitable to seek to indicate the exact influence of any one of them on the death-rate,—to say, for example, that such a per cent of the loss of life from this

disease in New York City is attributable to insanitary tenements, such another per cent to intemperance, and so on through the list. It is even found impossible to arrange the various factors in a logical development from the simple to the complex, whereby the necessity for anticipation might be avoided. After leaving the variations according to age and sex, the explanations and reservations are often perforce based on assumptions for which evidence is produced later on. Such a system of cross reference calls for this much of apology.

#### SEX AND AGE

This disease does not fall with equal severity on men and women nor on all ages.

In the registration area of the United States in 1900 the consumption death-rate of males was considerably higher than that of females. (Table I.)

TABLE I.—MORTALITY IN THE REGISTRATION AREA OF THE UNITED STATES, 1900, BY SEX.

SEX	TOTAL POPULA- TION	DEATHS FROM ALL CAUSES		DEATHS FROM CONSUMPTION		PROPORTION OF DEATHS FROM CONSUMPTION
		Num- ber	Rate per 1000 living	Num- ber	Rate per 1000 living	
Males.....	14,393,332	272,819	18.94	29,192	2.03	10.7 %
Females.....	14,413,937	239,850	16.64	24,770	1.72	10.3 %

But the general death-rate is always higher for males than for females, and the causes of this difference may account for a large part of the difference in the consumption death-rate. That they do not account for the whole of it is seen in a comparison of the proportion of deaths caused by consumption;

for tuberculosis causes 10.7 per cent of all deaths among males, but only 10.3 per cent among females. The disparity is still greater in New York City, where the proportion is thirteen per cent for men, but less than ten per cent for women.

This fact—that the mortality from consumption is greater among males than among females—must not be lost sight of in considering the relation of age, race, occupation, and geographical distribution to the disease.

The incidence of consumption in regard to age is shown, for the United States, in Table 2, which gives the death-rates from all causes and from consumption—that is, the number of persons who died during the year 1900 out of each 1000 persons living of the same age and sex. In the last two columns is given the proportion of all deaths due to consumption.

TABLE 2.—MORTALITY IN THE REGISTRATION AREA OF THE UNITED STATES.  
1900, BY SEX AND AGE

AGE PERIODS	DEATH RATE PER 1000 LIVING				PROPORTION CAUSED BY CONSUMPTION	
	All Causes		Consumption		Male	Female
	Male	Female	Male	Female		
All Ages	18.9	16.6	2.0	1.7	10.7 %	10.3 %
Under 5 years.....	56.7	47.5	0.7	0.6	1.3	1.3
5-14 years.....	4.4	4.2	0.2	0.3	4.0	7.8
15-24 years.....	6.7	6.1	1.9	2.1	28.7	34.8
25-34 years.....	9.5	8.5	3.1	2.8	32.5	33.1
35-44 years.....	12.4	10.5	3.0	2.2	24.3	21.1
45-64 years.....	24.1	20.1	2.9	1.7	12.0	8.6
65 and over.....	91.1	82.6	2.9	2.3	3.2	2.8

The consumption death-rate is greatest for both men and women at ages over twenty-five. Evidently this alone does not indicate the relative importance of the disease as a cause of death. For example, although the death-rate from consumption for men is almost twice as great at sixty-five years

of age and over as it is between fifteen and twenty-four, still the second rate represents 28.7 per cent of all deaths at that age, while the higher rate represents only 3.2 per cent of all deaths among old men. Similarly, at the ages twenty-five to thirty-four the death-rate from consumption is greater among men than among women, but it amounts to a larger percentage of the total mortality of women than of men.

Among men consumption causes the greatest proportion of deaths between twenty-five and thirty-four years; among women, between fifteen and twenty-four. Among both men and women it works its greatest havoc in early middle age, between the ages of fifteen and forty-four, when it causes about one-third of all the deaths that occur.

The next two tables (3 and 4) give the same facts about New York City, and show, in addition, the distribution of other tubercular diseases than consumption. The first of these tables, expressed in graphic form by Diagram I., shows the relation of deaths from consumption and from all tubercular diseases to the population; the second, with Diagram II., gives, what is more significant, their relation to the total number of deaths.

TABLE 3.—MORTALITY FROM TUBERCULOSIS IN NEW YORK CITY, 1900, BY AGE AND SEX

AGE	POPULATION		MORTALITY FROM PHTHISIS				MORTALITY FROM ALL TUBERCULAR DISEASES			
			Number		Rate per 100,000 Living		Number		Rate per 100,000 Living	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Under 5	199,683	197,604	115	74	57.59	37.45	610	463	305.48	234.37
5-9	177,591	177,156	23	29	12.95	16.37	86	78	48.43	44.03
10-14	149,906	151,358	26	49	17.34	32.37	50	81	33.35	53.52
15-19	140,670	162,081	182	216	129.38	133.27	201	238	142.89	146.84
20-24	161,988	192,853	495	456	305.58	236.45	527	487	325.33	252.52
25-34	343,175	338,175	1,552	1,128	452.27	333.56	1,628	1,179	474.39	348.04
35-44	261,095	232,950	1,279	658	489.86	282.46	1,340	698	513.22	299.64
45-54	146,495	141,837	738	285	503.77	200.93	767	307	523.57	216.43
55-64	78,692	82,591	356	182	452.39	220.36	365	193	463.85	232.34
65 and over	42,714	53,149	196	115	458.87	216.37	209	123	489.30	231.43



Mortality from Tuberculosis in New York City, by age and sex, 1900.  
 (Number of deaths per 1000 living at the same age—)

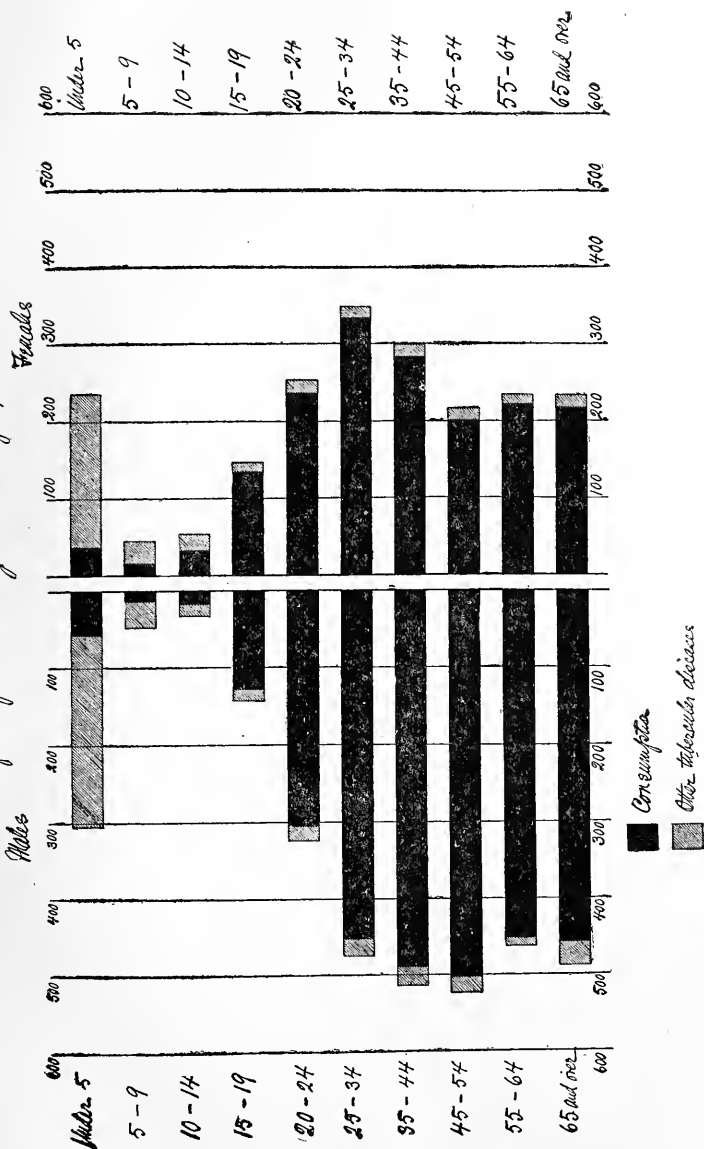


DIAGRAM I

TABLE 4.—PROPORTION OF MORTALITY CAUSED BY CONSUMPTION AND BY ALL TUBERCULAR DISEASES IN NEW YORK CITY, 1900

AGE	MALES						FEMALES					
	Number of Deaths			Percentage			Number of Deaths			Percentage		
	All Causes	Phthisis	All Tubercular Diseases	All Causes	Phthisis	All Tubercular Diseases	All Causes	Phthisis	All Tubercular Diseases	All Causes	Phthisis	All Tubercular Diseases
Under 5	14,006	115	610	100.00	0.82	4.36	11,830	74	463	100.00	0.63	3.91
5-9	1,046	23	86	100.00	2.20	8.22	1,027	29	78	100.00	2.82	7.60
10-14	431	26	50	100.00	6.03	11.60	432	49	81	100.00	11.34	18.75
15-19	677	182	201	100.00	26.88	29.69	712	216	238	100.00	30.34	33.43
20-24	1,360	495	527	100.00	36.40	38.75	1,343	456	487	100.00	33.95	36.26
25-34	4,095	1,552	1,628	100.00	37.90	39.76	3,297	1,128	1,179	100.00	34.21	35.76
35-44	4,527	1,279	1,340	100.00	28.25	29.60	3,080	658	668	100.00	21.36	22.66
45-54	3,951	738	767	100.00	18.63	19.41	2,937	285	307	100.00	9.73	10.45
55-64	3,398	356	365	100.00	10.48	10.74	3,166	182	193	100.00	5.75	6.10
65 and over	4,487	196	209	100.00	4.37	4.66	5,070	115	123	100.00	2.27	2.43

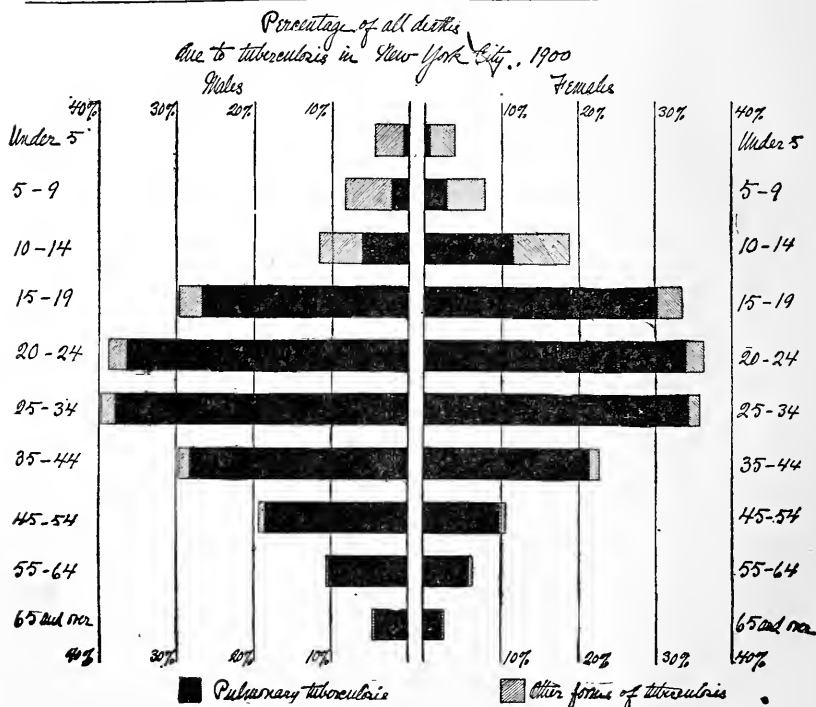


DIAGRAM II

These tables confirm the facts already noticed in regard to pulmonary tuberculosis: that it is a comparatively insignificant factor in the loss of life under ten years of age, that its importance culminates in the middle age-periods, and diminishes after forty-five. They show also that other tubercular diseases, in contrast, are of chief importance in infancy and childhood. Such diseases—for example, tuberculosis of the bones and glands—are not a considerable danger to others, but they are of significance as indicating that consumption, by supplying the source of infection, materially affects the well-being of children although it is not prevalent among them.

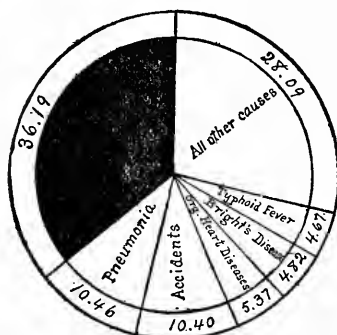
The next diagram (III.) brings out still more emphatically the point of interest. The two upper circles represent the mortality among men between the ages of twenty and thirty, and between the ages of thirty and forty-five; the two lower ones, that of women in the same age-groups. In each circle the black segment indicates the proportion of mortality due to consumption. It is, to say the least, a sobering reflection that over a third of all the men who die between the ages of twenty and thirty die from a preventable disease.

Another method of showing that this is a disease of the early middle years is by the average age at death. Omitting deaths under fifteen years of age from the calculation for obvious reasons, it is found that the average age in 1900 of persons dying from all causes was 52.8, but of those dying from consumption, only 37.4 years. It is this analysis of the mortality from consumption by age-periods which shows with startling clearness the economic significance of the disease. It attacks preferably either young men and women who are just beginning to repay to society the capital that has been invested in them through the years of their helplessness and education, or those who, a little farther on in life, are at the height of their productive capacity and have families dependent on them.

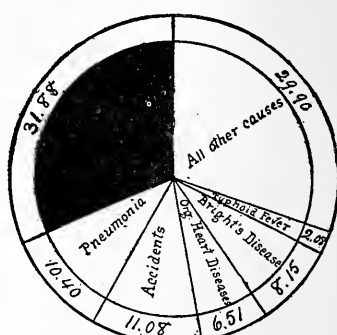
PROPORTION OF MORTALITY CAUSED BY CONSUMPTION  
IN NEW YORK CITY, 1901.

MEN

20 - 29 years.

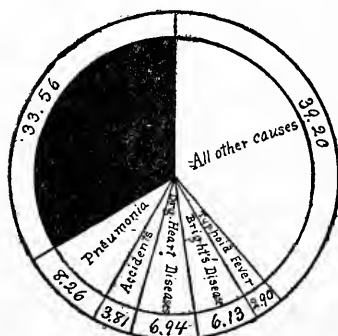


30 - 44 years.

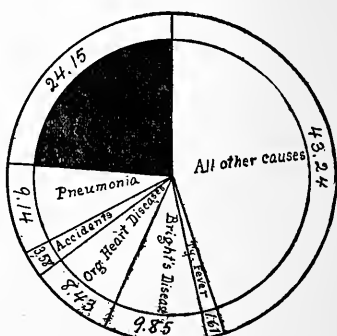


WOMEN

20 - 29 years.



30 - 44 years.



B

DIAGRAM III

## MARITAL CONDITION

An analysis of the mortality from consumption according to marital condition is chiefly of value for pointing a statistical moral.

There is a table in Section IX., of Part I., of the Report on Vital Statistics of the Census of 1900, which shows the death-rate of the single, the married, and the widowed, from certain important diseases and classes of diseases. This table seems to support Robert Louis Stevenson, with evidence he did not adduce, in his assertion that "marriage is a field of battle and not a bed of roses"—a battlefield, moreover, where the fatalities are many; for the death-rates from nearly all of the diseases, consumption included, are considerably higher among the married than among the single, and still higher among the widowed.

As marriage, however, and widowhood are phenomena of only certain ages, and of those ages at which consumption is especially destructive, while the single class includes a large proportion of children, who are comparatively free from this disease, the table is palpably misleading unless the element of age is taken into account.

Table 5 and Diagram IV. show the death-rates from consumption of the single, the married, and the widowed over fifteen years of age, in each of three age-groups.

TABLE 5.—DEATH-RATES BY MARITAL CONDITION AND AGE PER 100,000 POPULATION OF CORRESPONDING AGES

MARITAL CONDITION	AGE					
	15 to 44 years		45 to 64 years		65 years and over	
	Males	Females	Males	Females	Males	Females
Single .....	292.2	223.4	565.3	235.6	604.1	296.0
Married.....	208.3	237.6	223.1	153.7	244.2	236.1
Widowed .....	667.0	356.7	487.4	189.3	312.0	213.2

In general, the rate was lower for the married than for either the single or the widowed, and lower for women than for men. The only place where it was higher for women than for men was among the married in the age-group fifteen to forty-four years, and here it was also higher than for the single women at the same ages. This variation may be explained by reference to statements of such physicians as Dr. Flick of Philadelphia and Dr. Osler of Baltimore to the effect that "pregnancy is found to complicate, to develop, or to precipitate phthisis remarkably."

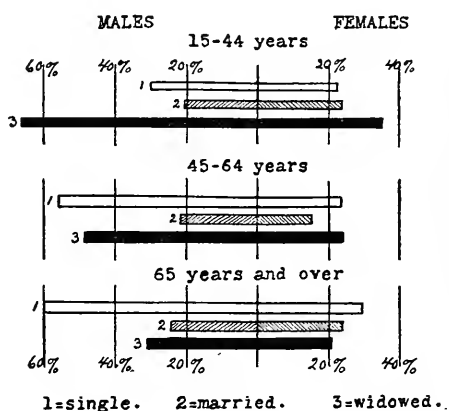


DIAGRAM IV

The highest rate of all is found among widowers under forty-four years. In the other two age-groups the rates for both widowers and widows, while higher than for the married, were lower than for the single. The cases of infection from a consumptive husband or wife, known to be of common occurrence, are more apt to appear here than among the married.

The high rates found among the single are due largely to occupation and to the fact that a far higher percentage of the single than of the married live in cities, where the devastation is much greater than in the rural districts.

To show more clearly the importance of consumption as a cause of death, the percentage of mortality due to this disease is shown in Table 6 and Diagram V.

TABLE 6.—NUMBER OF DEATHS CAUSED BY CONSUMPTION PER 100 DEATHS FROM ALL CAUSES, IN CERTAIN GROUPS OF THE POPULATION, CLASSIFIED ACCORDING TO MARITAL CONDITION, SEX, AND AGE

AGE	SINGLE		MARRIED		WIDOWED	
	Males	Females	Males	Females	Males	Females
All over 15 years	26.81	27.30	12.88	16.21	7.51	5.47
15-19 "	22.81	33.93	26.71	23.02	.....	25.00
20-24 "	33.08	40.82	30.35	31.00	29.79	42.22
25-34 "	35.13	40.38	29.87	30.33	43.32	38.55
35-44 "	28.65	23.30	22.43	20.24	30.57	24.31
45-54 "	20.44	13.61	13.09	10.95	19.80	10.37
55-64 "	11.92	7.85	8.25	6.61	8.89	6.27
65 years and over	5.60	3.34	3.26	3.61	2.68	2.40

For all ages over fifteen, it is seen that consumption caused a larger proportion of the deaths among married women than among married men, though the actual death-rate was lower. It caused the greatest proportion among the single of both sexes, and the smallest among the widowed. This is explained largely by the age composition of the two classes, the single having a large number of individuals at the ages when consumption is especially prevalent, while the average age of the widowed is high.

It appears, further, that at most ages consumption was a less important cause of death among the married than among the single or the widowed. Among the married men, however, it was more important than among either the single or the widowed at the ages of fifteen to nineteen years, and slightly more important than among the widowed at twenty to twenty-four years. At both of these periods the figures for married and widowed are, of course, small and of correspondingly less significance.

Consumption was also a more important cause among married women than among widows at the ages of forty-five and over.

Among single men it was responsible for a large proportion

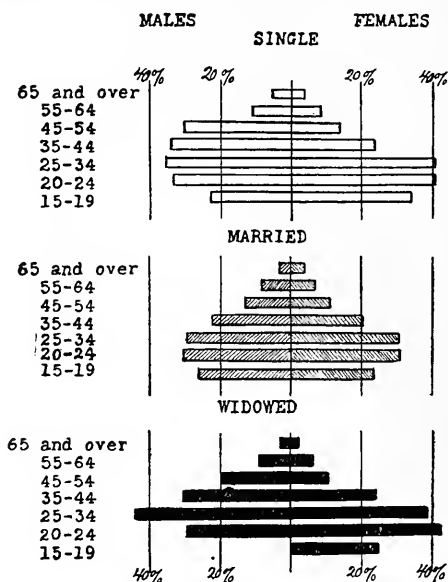


DIAGRAM V

of the deaths at all ages from twenty to fifty-five; among single women its greatest ravages appeared between fifteen and thirty-five. Among the married of both sexes and among the widowed it was of most importance at the ages twenty to thirty-five. The highest percentage of all is found among widowers between twenty-five and thirty-four years of age, where consumption caused forty-three per cent of the 591 deaths from all causes.

The favorable mortality among the married—the men at all ages and the women in the ages after forty-five—is found in all countries in the general death-rates as well as in the rates for consumption. Mayo-Smith considered this favorable mor-



tality to be due "partly to the fact that marriage in itself is more or less a process of natural selection, and partly to the greater regularity and soberness of life induced by marriage." This explanation applies with especial force to the case of consumption, where much depends upon the habit of life and exposure to risks of all sorts. It has been suggested that alcoholism, in particular, to which the single and widowed have more temptation than the married, is probably an important factor in increasing the prevalence of consumption among them.

Aside from this the variations according to marital condition are largely a matter of age and occupation, and thus due to attendant rather than to consequent features of the social relations.

#### RACE

The influence of race in a strict sense on any social phenomenon is hopelessly obscured by the historical accidents of conquest and migration whereby "groups with most unlike social traditions, characteristics, and possibilities are united indistinguishably in one group, while the elements of what should be one group . . . are scattered about among several groups."

When, realizing that color and birthplace are the only items in the census enumeration which can give any clue to race, we try on this basis to see some glimmerings of the truth, other difficulties arise. The influence of race, even with this modified and wholly illegitimate definition of the term, is obscured by the presence of other factors. In connection with this question of the prevalence of consumption such other factors are the age and sex constitution of the different national groups, their distribution between city and country, the varieties of climate to which they are exposed, and their economic and social conditions. One ends by feeling the force of the dictum that while "we need not deny that blood tells, we should not be prematurely certain that we can hear what it tells, or that we can distinguish the voice of the particular blood that speaks."

TABLE 7.—MORTALITY IN THE REGISTRATION AREA, BY COLOR

COLOR	POPULATION	MORTALITY				PERCENTAGE OF ALL DEATHS CAUSED BY CONSUMPTION
		From all Causes		From Consumption		
		Number	Rate per 1000	Number	Rate per 1000	
White.....	27,555,800	475,640	17.29	47,641	1.74	10.05
Colored <sup>1</sup> .....	1,251,469	36,625	29.27	6,063	4.84	16.55

<sup>1</sup> Includes all persons of African descent, Indians, Chinese, and Japanese.

The most obvious comparison in the United States is based on the broad distinction of color. It is seen from Table 7 that while the general mortality of the colored is seventy per cent higher than that of the white population the consumption death-rates show a far greater difference, the rate for the colored being not far from three times the rate for the white. The age constitution of the two classes explains none of the difference, since the percentage of population at the ages when consumption works most of its destruction is almost the same. As shown in Table 8, forty-two per cent of the white population is between fifteen and forty years of age, and 42.1 per cent of the colored. For explanation of the high death-rate from

TABLE 8.—PERCENTAGE OF POPULATION AT CERTAIN AGE-PERIODS, BY COLOR

AGE	WHITE	COLORED				
		Total	Negro	Chinese	Japanese	Indian
Under 5 years.....	12.1	13.7	13.9	1.3	0.7	14.5
5 to 14 years.....	22.4	25.9	26.2	2.2	1.2	25.7
15 to 39 years.....	42.0	42.1	46.2	44.5	91.4	37.2
40 years and over.....	23.5	18.3	13.7	52.0	6.7	22.6

consumption among the colored population, it is better to consider the different elements of this group, which differ one from another as much as they differ from the whites. For this purpose figures for the registration area are given in Table 9. The death-rate from consumption is higher for all elements

TABLE 9.—MORTALITY OF THE WHITE POPULATION AND OF THE COLORED RACES IN THE REGISTRATION AREA, 1900

	PERCENTAGE OF POPULA- TION OF THE U. S. FOUND IN REGISTRA- TION AREA	DEATH-RATES PER 1,000		PERCENTAGE OF ALL DEATHS CAUSED BY CONSUMP- TION
		All Causes	Consumption	
White.....	41.00	17.3	1.74	10.03
Negro.....	13.00	30.2	4.85	16.07
Indian.....	5.00	22.8	5.07	22.23
Chinese.....	54.00	18.8	6.57	34.94
Japanese.....	34.00	10.3	2.40	23.26

of the colored population than for the white (1.74 per 1000), but it varies from 2.4 per 1000 among the Japanese, to 6.57 per 1000 among the Chinese. These figures are unsatisfactory in that only a small percentage of the negro and Indian populations of the country is found in the registration area, but the statistics for the whole country are too unreliable to be used.

The difference between the Japanese and the white population is not too great to be attributed to the difference in age constitution of the classes, over ninety-one per cent of the Japanese being between the ages of fifteen and forty. The Chinese also have an insignificant proportion of children, and are found, moreover, almost entirely in cities, and in the worst parts of the cities, in insanitary surroundings. As a natural consequence of their object in coming to America—to amass a fortune and take it back to China—they are almost invariably undernourished. Their constitutions are weakened by drugs, and, except on the Pacific Coast, they are under the additional disadvantage of unaccustomed extremes of climate.

The five per cent of the Indians of the United States living in the registration area illustrate the disastrous effect of civilization on a savage race. Consumption follows on the transition from life in the open to conditions of city life, and its ravages are increased by the craze for "fire-water," against which the savage constitution has no power of resistance.

The case of the negroes is more complex. To some extent they also are suffering from a civilization foreign to their nature, imposed upon them and not evolved by themselves. The rivalry between the supporters of environment and of race characteristics as the chief explanation of the present inferiority of the negroes, as a whole, whether physical, mental, or moral, bids fair to go on to the end of the chapter, since the combatants on either side display the open mind of the Scotchman who declared himself willing to be convinced by his opponent in argument, but added suggestively that he would like to see the man who could convince him. Even those who are inclined to think all the disabilities of the negroes inherent and ineradicable admit, however, that such disabilities are probably aggravated by the conditions under which they live.

Certain facts about their social and economic conditions have a direct bearing on this problem of consumption. Everywhere the mass of the people is ignorant of the simplest laws of hygiene. They are prone to have an aversion to water, a preference for an unwholesome diet, and to choose their clothing, when they have a chance to choose it, for its decorative rather than for its utilitarian value. Generations of dependence have left them with a child-like faith in the interest and activity of higher powers in their behalf, which from the economic standpoint is mere unromantic improvidence. Until the Civil War they were an agricultural people; for the last forty years the city has been drawing them away from the fields. In all cities they live, for the most part, in the worst districts, crowded together in tenements often unfit for habitation. Their work, if they succeed in getting any and keeping it, is indoors. Their whole life is thus spent in confinement, in unfavorable contrast with their ante-urban experience, when

practically all of the daylight hours were spent in the open air, and when their cabins, however crowded at night, and dirty, and dark, were rarely sufficiently well built to provide against ventilation. In the cities, therefore, the ignorance and carelessness of the race in regard to laws of health find no let or hindrance to the working out of their logical consequences. In the larger cities of the North, moreover, the severity of the winter, sufficiently trying to the semi-tropical constitution under favorable circumstances, becomes serious in its consequences when sufficient clothing is not only unobtainable, but its importance not understood.

TABLE 10.—MORTALITY FROM CONSUMPTION IN CERTAIN SOUTHERN CITIES AND IN THE RURAL PART OF CERTAIN SOUTHERN STATES, 1900

CITY OR STATE	POPULATION	MORTALITY FROM CONSUMPTION			
		Death-Rate per 100,000 Living		Excess of Colored Death-Rate	
		White	Colored	Number of Deaths per 100,000	Per Cent
<b>I. CITIES:</b>					
Mobile, Ala.....	38,469	271.0	591.8	320.8	118.4
Washington, D. C.....	278,718	210.4	513.8	303.4	144.2
Atlanta, Ga.....	89,872	220.0	505.9	285.9	130.0
Savannah, Ga.....	54,244	245.1	529.5	284.4	116.0
New Orleans, La.....	287,104	256.0	629.5	373.5	145.9
Charleston, S. C.....	55,807	189.8	674.7	484.9	255.3
Memphis, Tenn.....	102,320	169.9	378.4	208.5	122.7
Nashville, Tenn.....	80,865	222.5	638.5	416.0	186.9
<b>II. STATES (excluding cities given above):</b>					
Georgia.....	2,072,215	72.4	138.1	65.7	90.7
Louisiana.....	1,094,521	54.5	122.9	68.3	125.2
South Carolina.....	1,284,509	71.2	199.0	127.8	179.5
Tennessee.....	1,837,431	166.4	368.9	202.5	121.7
Florida.....	528,542	78.3	140.1	61.8	78.9

Industrial conditions and irresponsibility on the part of husbands and fathers too often make the mother the chief or sole wage-earner, and the children are thus left to grow up as they can. The small proportion who succeed in living through childhood and youth arrive, many of them, at maturity with a weakened constitution and habits of life which offer every encouragement to the *bacillus tuberculosis*. In the registration area, where ninety-three per cent of the negroes are found in cities, it is not surprising that even among the children consumption is prevalent. The death-rate from consumption under fifteen years of age, which is only 31.8 per 100,000 for the white population, is 246 for the colored, a rate considerably higher than is found at any age among the native-born whites of native parentage.

The bearing of city conditions on this point is indicated by the figures given in Table 10 (Diagram VI.). It is seen that not only is the death-rate for the colored much lower in the rural parts of states containing a large negro population than in the cities of those states, but in almost every case the difference between white and colored is considerably less in the country than in the city.

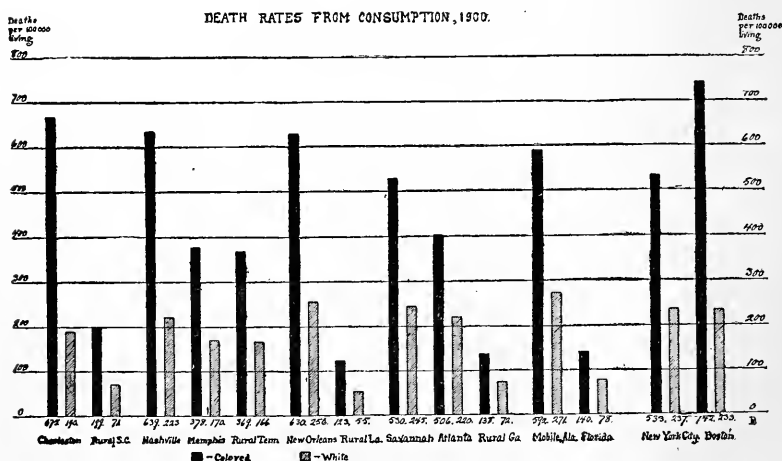


DIAGRAM VI

Turning to the various elements of the white population it is necessary to take into consideration the factor of age, and since about seventy per cent of all deaths from consumption occur between the ages of fifteen and forty-four, the death-rates at these ages constitute the best index of the susceptibility of the different nationalities. The birthplace of mothers is used as the basis of classification in order that as large a quota as possible of the national group may be included.

In Table 11 (Diagram VII.), the nationalities are arranged

TABLE 11.—MORTALITY FROM CONSUMPTION, 15 TO 44 YEARS OF AGE, BY COLOR AND NATIONALITY

COLOR AND NATIONALITY	DEATH RATE PER 100,000 POPULATION
Total Colored.....	587.4
White.	
Mothers born in—	
Ireland.....	428.0
Bohemia.....	235.2
Scandinavia.....	233.7
France.....	220.6
Germany.....	205.9
Scotland.....	201.1
Canada.....	199.7
United States.....	162.5
England and Wales.....	151.4
Italy.....	149.9
Russia.....	131.1
Hungary.....	113.4
Poland.....	67.4

according to the death-rate from consumption, at the age when this disease is most prevalent. The rate for the colored is greater than that for any element of the white population. Among the white population the Irish easily lead the way, with a rate nearly twice as high as that of the Bohemians, next below. The predilection of the Irish for the crowded parts of cities, the Celtic tendency to take no thought for the morrow, their frequent intemperance, and the generations of poverty

behind them, are circumstances that go far to explain their leadership in this respect.

The position of the Bohemians next is probably due largely

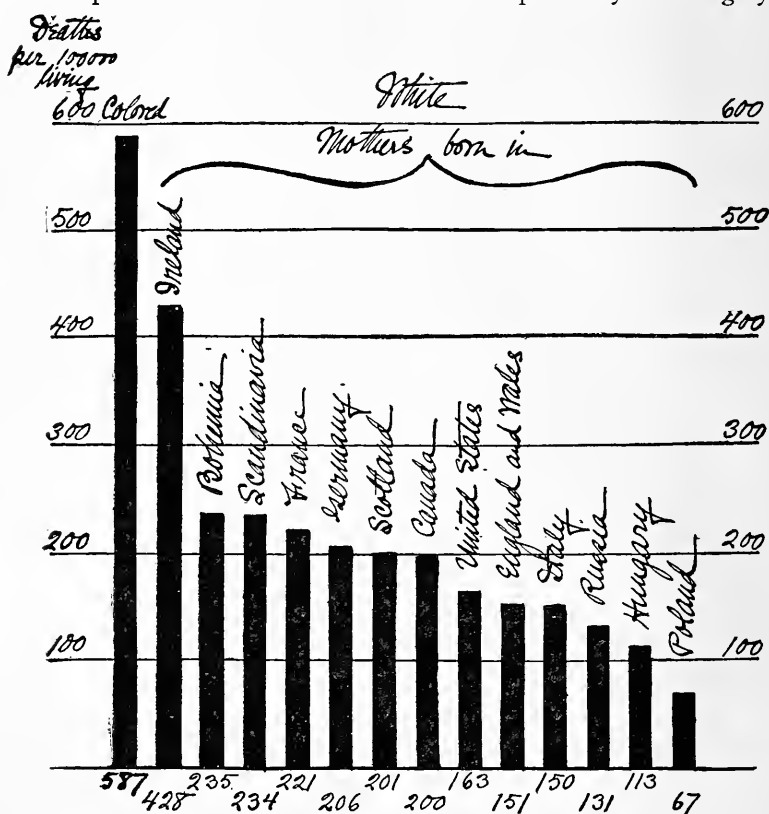


DIAGRAM VII

to their congregation in cities, in insanitary housing conditions, and to the equally insanitary conditions of the occupations in which they engage. It is hard to find an explanation for the high rate among the Scandinavians, so many of whom live in the country. It has been suggested that the effect of the new climatic conditions may be to weaken the vitality as well as to produce the radically different physical type of the second generation. Their prejudice against ventilation is doubtless a factor.



Habits in regard to drink help to explain the variations in this table. The Italians, Russians, Hungarians, and Poles are found at the lower end of the scale, although they live almost exclusively in the tenement districts of the large cities, under far worse conditions than the Germans, or even the Irish, and have a large preponderance of young men, the class most liable to consumption. But these nationalities are comparatively free from drunkenness.

The case of the Italians is especially remarkable because, in addition to their unfavorable surroundings, they are exposed to extremes of climate to which they have never been accustomed, and are, according to American standards, habitually underfed. To counteract these poor conditions, they have a temperament to which worry and anxiety are foreign, and the men engage in outdoor occupations. Almost half of the Italian men work here as common laborers on the construction of streets and railroads, while an aversion to the strenuous life leads many into the gentle and salubrious calling of peddling. It may be, also, that the carnivorous American underrates the dietary value of macaroni and cheese.

After bringing all these considerations to bear on the statistics, there remains to be reckoned with the testimony of practical workers that tuberculosis is more common among the Italians than is indicated by the death-rate in early middle life. The fact that tuberculosis of the glands and joints is unusually common among Italian children would also make one expect a higher consumption death-rate among the older generation. A partial explanation of this discrepancy is found in the attachment of the Italians for their native land, which frequently operates to find a way of sending the invalid home to die among the vines and olive trees of his native village.

The Russians, Hungarians, and Poles, who show a still lower death-rate from consumption than the Italians, are nearly all Jews, and throughout the world Jews are found to have a comparatively low death-rate from this disease. Though there are indications that the Americanization of the Hebrew immigrants is being accompanied by an increased susceptibility to this

disease, it is true that they are still comparatively immune. It is probable that the death-rate among the Jews is not an accurate index to the prevalence of the disease, for the reason that among them the average duration of tuberculosis is much longer than among other races. "Quick consumption" is almost unknown, and the disease often runs for eight or ten years before it proves fatal. The death-rate may be lowered also, though to a less extent than among the Italians, by the return of some of their sick to Europe. Allowing for this, and assuming that consumption is considerably more prevalent than the death-rate indicates, it still appears that the Hebrew constitution has a remarkable resisting power. This power of resistance exists in spite of narrow chests and slight stature, in spite of extreme poverty and still greater frugality, in spite of mental overexertion, lack of exercise, employment in the sweated industries, and contact with the probability of infection in second-hand clothing. Various explanations have been advanced. Employment in occupations where they are protected from the weather can hardly be looked upon as an advantage. The infrequency of alcoholism, however, and, indeed, their temperance in all directions, the mandates of their religion in regard to a careful inspection of meat before it can be pronounced "Kosher," and in regard to bathing and house-cleaning at certain intervals,—all these circumstances help to account for the fact that there is one evil which has not been meted out to this ill-used people to its fullest extent.

Generalization on this point of the relation between consumption and race is a delicate task, but a few conclusions seem warranted. Much of the variation in consumption death-rates in the United States is due to the adventitious circumstances of age constitution, and urban or rural residence. Eliminating the first of these factors and making allowance for the second, the differences which remain seem to be the resultant of a variety of social and economic influences. One of the most conspicuous of these influences is that exerted by our high-grade civilization over the less advanced peoples within our bounds, resulting, so far, chiefly in that increase of sorrow

which comes to him "who increaseth wisdom," without the attendant compensations. Other active influences include occupation, housing, and temperament, and habits governing forms of dissipation, food, clothing, and exercise.

To go back still farther and inquire, in regard to each of these influences, the relative responsibility of fundamental racial characteristics, whether physical, mental, or moral, and of the environment in which these characteristics are operating, would be to enter on a speculation only less alluring than futile.

To supplement this analysis of the death-rates in the United States another table is given, in figures and in graphic form, showing the relative importance of consumption among the principal national groups in the registration area in 1900 and in Manhattan and Bronx in 1902. (Table 12, Diagram VIII.) The two sets of figures are not strictly comparable, since the deaths of negroes in the registration record are not given separately from those of the total colored, and Austrians and Swiss are included with "all other countries."

The diagram is of a complexity that can be excused only by the desirability of comparing at the same time the men with the women, and New York City with the United States; it is justified if it makes the differences somewhat more evident than the table, even though it does not come up to the ideal in the way of simplicity.

The nationalities are arranged according to the importance of consumption among the men in New York, which is represented by a descending series of solid blocks. The blocks for the New York women are the heavily shaded ones of the same width. The percentages for the men and women of the registration area are expressed in the wide blocks, shaded and plain respectively, superimposed on those for New York City. To bring out that there are four distinct series of blocks, lines have been drawn connecting the blocks which form a series. Finally, two lines have been drawn across the whole diagram, showing the average for men and for women of all nationalities in New York City. The averages for the registration area were both

TABLE 12.—IMPORTANCE OF CONSUMPTION AS A CAUSE OF DEATH AMONG THE MEN AND THE WOMEN 15-44 YEARS OF AGE IN CERTAIN NATIONAL GROUPS IN MANHATTAN AND BRONX, IN 1902, AND IN THE REGISTRATION AREA OF THE UNITED STATES, 1900

NATIONALITY	MANHATTAN AND BRONX, 1902						REGISTRATION AREA OF THE UNITED STATES, 1900					
	Males			Females			Males			Females		
	Number of Deaths		Percent- age of all Deaths due to Con- sumption	Number of Deaths		Percent- age of all Deaths due to Con- sumption	Number of Deaths		Percent- age of all Deaths due to Con- sumption	Number of Deaths		Percent- age of all Deaths due to Con- sumption
	All Causes	Con- sumption		All Causes	Con- sumption		All Causes	Con- sumption		All Causes	Con- sumption	
Chinese.....	44	22	50.00	0	0	0.00	386	172	44.56	32	8	25.00
Mothers born in Ireland.....	2,103	881	41.89	609	609	34.39	10,354 <sup>a</sup>	3,045	38.10	8,912	3,117	34.98
Negroes.....	219	91	41.55	79	79	33.76	6,743	2,171 <sup>a</sup>	32.20 <sup>a</sup>	6,075 <sup>a</sup>	2,135 <sup>a</sup>	35.14 <sup>a</sup>
Mothers born in—												
Scotland.....	68	26	38.24	56	10	17.86	542	160	29.52	482	136	28.22
France and Switzer- land.....	87	30	34.48	66	21	31.82	232 <sup>b</sup>	67 <sup>b</sup>	28.78 <sup>b</sup>	178 <sup>b</sup>	53 <sup>b</sup>	29.77 <sup>b</sup>
Germany.....	1,101	357	32.43	741	184	24.83	5,794	1,695	29.25	4,896	1,334	27.25
Scandinavia.....	119	36	30.25	82	29	35.37	1,056	311	29.45	894	312	34.90
Austro-Hungary.....	319	96	30.09	263	54	20.05	398 <sup>c</sup>	111 <sup>c</sup>	27.89 <sup>c</sup>	276 <sup>c</sup>	60 <sup>c</sup>	21.74 <sup>c</sup>
United States (white) Canada and New- foundland.....	838	232	30.07	726	215	29.61	13,298	3,381	25.42	13,801	3,846	27.87
Russia and Poland.....	48	14	29.17	58	16	27.59	2,217	724	32.66	2,559	1,006	39.31
England and Wales.....	358	104	29.05	380	63	16.58	1,022	227	22.21	732	155	21.17
Italy.....	184	51	27.72	139	30	21.58	1,706	412	24.15	1,549	324	20.92
.....	452	99	21.90	342	82	23.98	1,126	204	18.12	693	159	22.94
All Nationalities.....	10,390 <sup>d</sup>	3,412 <sup>d</sup>	32.84 <sup>d</sup>	8,119 <sup>d</sup>	2,312 <sup>d</sup>	28.48 <sup>d</sup>	68,656	19,505	28.41	59,864	17,680	29.53

<sup>a</sup> Total colored, figures for negroes not being given separately.

<sup>b</sup> France only.  
<sup>c</sup> Hungary and Bohemia only.

<sup>d</sup> New York City.



so close to the average for women in New York that they were not included in the diagram; not only would their own significance have been obscured, but they would have added materially to the confusion already presented by the number of elements.

While the series of solid black blocks descends steadily from the fifty per cent among the Chinese to the twenty-two per cent among the Italians, the other varieties of blocks do not, as is easily seen from the crossing of the lines which connect them, form three other uniformly descending series, at equal distances from one another and from the first series. On the contrary they make conspicuous deviations.

In comparing Manhattan and Bronx with the registration area it is noticeable that with only one exception the percentage for men is higher in the former, while the percentage for women is higher in the registration area than in the city among six of the thirteen national groups, and in most of the others the difference is very slight. Inasmuch as about one-fourth of the population of the registration area is rural in the census definition of the term,<sup>1</sup> these figures seem to support the contention that women living in the country and in small towns do not profit equally with men from the abundance of sun and air at their command. They are apt to keep to the house more closely than do the women of the city and too often their standard in regard to ventilation is as low as that of the tenement dweller. The comparison by nationalities further suggests that, disregarding the Scotch and Canadians, where the figures in New York are too small to be accepted as trustworthy, among the Irish, the negroes, the Germans, and the Russians, Roumanians and Poles, the burden of the unfavorable conditions attending life in New York City falls on the men.

The particularly valuable feature of the statistics is that they bring out certain contrasts between the men and the women of the different groups. The greatest contrasts are found among the Scotch and the Russians in New York, where the

<sup>1</sup> "Rural" includes places of less than 8,000 inhabitants.

difference in favor of the women is respectively nine and six times as great as in the averages for the total population. Among the Scandinavians and the Italians, on the other hand, both in New York and in the registration area, and among the Canadians of the registration area, the advantage is with the men, in bold violation of the general rule.

Explanations can only be hazarded. It would seem that the Scotch constitution, re-enforced by a simple and wholesome diet, ought to be naturally inhospitable to the *bacillus tuberculosis*, and that if it were not for the element of intemperance both men and women would have a low degree of susceptibility to consumption. For this reason the percentages for the United States seem far more reasonable than those for New York City, and, considering the small numbers on which the latter are based, the most plausible explanation for them is that they are not indicative of the real conditions in the city. The great difference among the Russians, Roumanians, and Poles in New York may be due to the Jewish ideals which keep the woman in the home, and protect her as far as possible from the struggle for existence, as well as to the almost incredible efforts which the husband and father makes in the struggle, and the character of his usual occupations. Doubtless this struggle is nowhere else so hard as it is in New York, and since the figures in this case are comparatively large it may be allowable to assume that while ordinarily consumption is comparatively rare among both men and women of these nationalities the conditions of life in New York City tend to increase it considerably among the men.

Among the Italians the same general social principle in force among the Hebrew peoples—that the woman's place is at home—has exactly the opposite effect on the relative susceptibility to consumption. But this is easily understood by reference to the amount of home work done by the Italian women to supplement their husbands' earnings, their lower average of efficiency as housekeepers, which tends to make their homes less hygienic than those of the Jewish women, and, on the other hand, the prevailing out-door element in the occupation

of the men. As this element is more prevalent everywhere else than in New York it is natural that its influence should be especially marked in a very low percentage for men in the registration area.

The Scandinavian women show the highest percentage of all in New York, six points higher than the average for women, while the Scandinavian men stand almost three points lower than the average for men. The same relation exists between the percentages for the men and the women in the registration area. Occupation probably has much to do with this, for the women go into domestic service, which, as will be seen later, has the highest general death-rate and the highest consumption mortality of all occupations for women, while the men are apt to be carpenters, seamen, dock builders, or day laborers.

Among the Canadians also, in the registration area, the women have a percentage much higher than the men. Both are conspicuously high. Domestic service must be responsible for the abnormal amount of consumption (almost forty per cent) among these women, as it is among the Scandinavians. The figures for New York, as in the case of the Scotch, are too small to give value to the percentages.

The one perfectly safe deduction from these figures, that the importance of consumption as a cause of mortality among the men of a national group cannot be taken as an index to its importance among the women, confirms the position tacitly assumed in explaining the variations in Table II, namely, that "race characteristics," strictly speaking, play an unimportant part in this connection. For a predisposition to consumption, or an inability to struggle against it, would, if arising from the physical type of the race, show itself equally in the two sexes. The conclusion is plain that this tempting explanation should be used only as a last resort.

#### OCCUPATION

To disentangle the influence of occupation on the death-rate from consumption is an undertaking as difficult as important.



If the difficulties attaching to nomenclature and classification could be surmounted, and if complete statistics by age periods were available, there would still remain influences not susceptible of statistical measurement which would have to be eliminated before the industrial influence could be estimated justly. Such factors are inherited tendencies, natural, physical, and mental constitution, conditions of life outside of working hours, and, what is perhaps most potent and least tangible, the process of natural selection which determines the personnel in every occupation.

For the health of the persons found in any employment may be the explanation of their presence there rather than the result of it. A man of frail physique is not apt to become a stone cutter or an iron moulder, nor, on the other hand, does it often chance that a strong man prefers to work in a sweat shop or act as "ticket-chopper." In the industrial scale there are the complementary phenomena of the "fit" surviving and pushing on to higher grades, and the "unfit" dropping down from one level to another. At the bottom are found the intermittent and casual laborer and the chronically unemployed, —there, for the most part, because they have proved unequal, in some point, for other things. By this automatic sifting process the death-rate is kept low in some industries, while it is correspondingly raised in those which are not prohibitory to persons who are weak or ill.

There are no strictly satisfactory figures on this point of the relation between occupation and consumption. To be strictly satisfactory they should be large enough to be representative, they should be given separately for each occupation, and they should be classified by age and nationality as well as by sex.

The first tables and diagram apply to the "registration states" of 1900. These were the six New England states, New York, New Jersey, and Michigan, with the addition of the District of Columbia. Unfortunately the returns from the registration cities outside the registration states were not received in time to be incorporated in this section of the census analysis. The statistics available, therefore, have the

disadvantage of representing only a small area of the United States, and that an area comparatively homogeneous in climatic condition and industrial character. They have in compensation the advantage of being comparatively reliable.

For the purpose, however, of showing the relation between occupation and any specified disease they are practically valueless, because of the omission of data for computing death-rates from different causes at different ages. It is impossible to draw any conclusions about the influence of occupation on the prevalence of consumption from crude death-rates, since consumption is largely a phenomenon of early and middle adult life, and the proportion of men at those ages varies from less than half in one occupation to nine-tenths in another. The statistics here given accordingly call for explanation from facts already known, and an opportunity has been lost of making a valuable addition to the subject of industrial hygiene.

The first table (13) gives various facts about men engaged in gainful pursuits, in eight classes of occupations. While most of these classes contain such diverse elements that the facts about the combination are of slight significance, it is still worth noticing that the high death-rates from consumption are in those occupation groups where there is a lower average of general comfort as well as a larger proportion of persons at the age most susceptible to the disease.

In the diagram (IX.) these eight groups are resolved into fifty-three specific employments or small groups of employments more or less alike. The grouping of restaurant keepers with saloon keepers, etc., of hotel keepers with boarding-house keepers, of quarrymen with miners, and of fishermen and oystermen with sailors and pilots, are perhaps the most regrettable combinations.

It is noticeable that the component parts of the eight groups given in the first table are widely scattered; for example, the first four employments in this list, the twentieth, the thirtieth, and the forty-sixth, all belong to the group of "manufacturing and mechanical industry" which ranks four in the table by groups.

TABLE 13.—POPULATION, DEATHS, AND DEATH-RATES, OF MALES IN THE REGISTRATION STATES, 1900, BY CLASSES OF OCCUPATIONS

OCCUPATIONS	POPULATION		Death-Rate from all Causes (per 1,000)	MORTALITY FROM CONSUMPTION	
	Total	Percentage 15-44 Years of Age		Number of Deaths	Rate per 1,000 Living
All Occupations.....	5,575,745	70.7	15.0	13,197	2.4
1. Laboring and servant.....	800,083	74.1	20.2	3,018	3.8
2. Clerical and official.....	424,781	75.6	13.5	1,202	3.0
3. Public entertainment.....	87,888	72.9	15.4	236	2.7
4. Manufacturing and mechanical industry.....	1,796,028	72.8	13.8	4,710	2.6
5. Personal service, police and military.....	149,164	70.7	12.9	380	2.5
6. Professional.....	203,104	71.2	15.3	370	1.8
7. Mercantile and trading.....	493,994	71.9	12.1	819	1.7
8. Agriculture, transportation, and other outdoor.....	1,528,241	64.2	15.8	2,250	1.5
All other occupations.....	90,662	74.1	6.5	122	1.3

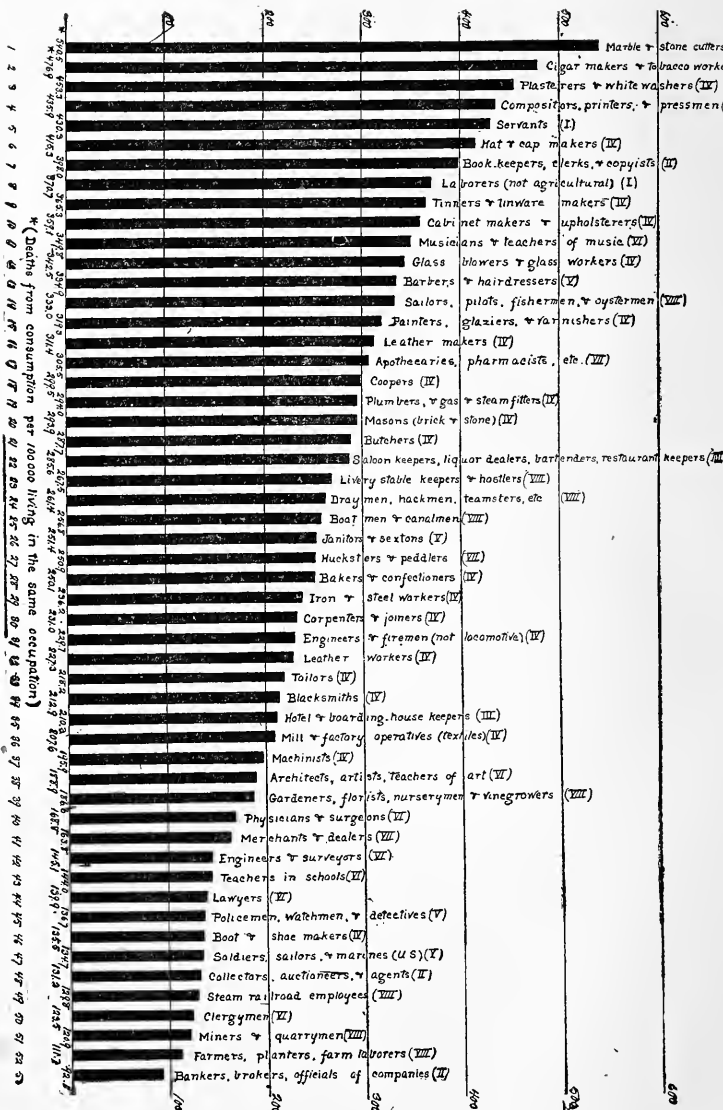
The consumption death-rate of marble and stone cutters is six times that of bankers, brokers, and officials of companies, and the mortality in the other fifty-one employments ranges between these extremes.

It must be remembered that in the case of consumption there is, more often than in most diseases, a long period of industrial decline, during which the man drops from the employment that had been his for years to one of lower grade, or through several descending grades, to the ranks of the unemployed. The responsibility of his death is in this way fixed not on the occupation in which he was engaged when he contracted his illness, but on the last one in which he was engaged prior to his death.

The high death-rate among marble and stone cutters is probably due to the irritation of the respiratory tract by fine particles of marble and stone. In the case of cigarmakers and tobacco workers, who rank next, it is probably bad air and other unsanitary conditions in the workroom, combined with equally poor conditions at home, which are responsible, rather than any inherent feature of the work.

Plasterers and whitewashers, hat and cap makers, tinnern and

DIAGRAM IX



tinware makers, cabinet makers and upholsterers, ranking 3, 6, 9, and 10, respectively, are all constantly breathing dust of various kinds. Compositors, printers, and pressmen, fourth in the list, work in notoriously unhealthful surroundings, in crowded rooms with little ventilation, often so dark that artificial light is required, even in the daytime. Servants (5) are generally well-fed, but often have long and irregular hours of work, poor sleeping arrangements, and too little fresh air. Bookkeepers, clerks, and copyists (7) breathe impure air almost exclusively—in the office, on the street-cars, and in their rooms and places of recreation in the evening.

The last three classes, moreover, show a large proportion of men at the ages when consumption is most prevalent.

Under the heading "musicians" is included a wide range of social conditions, from the composer, the orchestra conductor, the opera singer and the concert artist, to the poorest organ grinder. A large proportion pursue their vocation in the close, overheated, infected air of the cheaper theatres, dance halls, and restaurants, or earn a scanty living on the street, where the advantage of fresh air is counterbalanced by exposure to hunger and want of all sorts. The irregularities and hardships of the life, often leading to intemperance, would be enough to establish a predisposition to consumption, and explain the high mortality, were there not also the consideration that no small percentage of this class, especially among the street musicians, is composed of the broken-down results of other occupations.

The group consisting of draymen, hackmen, and teamsters, ranking 24, and the janitors and sextons, the hucksters and peddlers, a little farther on, are other examples of occupations which offer a refuge to men who are either not naturally strong, or have become incapacitated for harder work. This fact, together with the long and irregular hours, and the unresisted temptations to drink, would bring about a higher death-rate from all causes, as well as from consumption, were it not for the factor of plentiful fresh air in their lives.

Beyond a doubt, saloon keepers and bartenders would show far less favorable mortality figures if they could be separated

from the restaurant keepers, with whom they are grouped; for not only are they apt to be intemperate, but the saloons, in which they spend much of their time, are, for the most part, infested with tubercle bacilli.

Hat and cap makers show the high death-rate which would be expected from the conditions under which they work,—the overcrowded, ill-ventilated apartments, their constrained position, and long hours,—and from the low rate of wages, entailing a comfortless home. The position of tailors, however, below the average death-rate, and number 33 in the list, is surprising. The presence of large numbers of Hebrews would tend to lower the rates in both branches of industry. It may be that the dust and dyes used in hat and cap making are more injurious than in the garment-making trades, and it is probable that more improvement has been made in the workrooms of tailors than in those of hat and cap makers. Glass blowers, in class 12, show the influence of exposure to extreme heat.

The class of non-agricultural laborers is so large and made up of so many elements that it is dangerous to generalize about it. It is safe to say, however, that its members work irregularly, at an exhausting kind of labor, which induces intemperance, that many of them bring from Europe constitutions weakened by a struggle with hard times there, and live here in the cheapest of lodging-houses or the worst of tenements.

All these occupations with a noticeably high mortality from consumption belong primarily to cities and large manufacturing towns, while among those with a consumption death-rate below the average of 2.4 per 1000 are found almost all that are carried on in small towns or in the country. In company with the outdoor pursuits are all of the professions, the better-paid trades, and other occupations which imply a comparatively high degree of comfort.

The position of miners and quarrymen so near the bottom of the list requires explanation, since the exhausting character of their work and the amount of dust they inhale would suggest a high degree of susceptibility to this disease. English statistics show that quarriers have a high consumption mor-

TABLE 14.—POPULATION, DEATHS, AND DEATH-RATES, OF FEMALES IN THE REGISTRATION STATES, 1900, BY OCCUPATIONS

OCCUPATIONS	POPULATION		Death-Rate from all Causes (per 1,000)	MORTALITY FROM CONSUMPTION	
	Total	Percentage 15-44 Years of Age		Number of Deaths	Rate per 1,000 Living
All Occupations.....	1,587,874	83.6	8.3	2,744	1.7
1. Servants .....	403,801	86.5	17.1	1,291	3.2
<sup>1</sup> 2. Telegraph and telephone operators.....	7,801	97.3	5.4	16	2.1
3. Bookkeepers, clerks, and copyists.....	72,713	93.6	5.6	144	2.0
4. Musicians and teachers of music.....	16,566	88.8	5.0	28	1.7
5. Mill and factory operatives (textiles).....	162,392	89.7	4.0	234	1.4
6. Milliners.....	29,122	89.1	5.9	40	1.4
<sup>1</sup> 7. Cigarmakers and tobacco-workers.....	12,838	89.2	4.1	17	1.3
8. Dressmakers and seamstresses.....	195,176	83.2	5.2	254	1.3
9. Teachers in schools.....	91,964	90.9	5.9	116	1.3
10. Nurses and midwives.....	41,912	68.4	9.5	42	1.0
11. Laundresses.....	59,300	66.8	5.1	56	.9
12. Stenographers and typewriters.....	33,780	98.3	2.7	31	.9
<sup>1</sup> 13. Artificial flower and paper-box makers....	12,624	92.4	1.3	6	.5
<sup>1</sup> 14. Hotel and boarding-house keepers.....	19,755	43.8	4.5	3	.2
All other occupations.....	428,130	78.4	5.7	466	1.1

<sup>1</sup> Number of deaths too small to be significant.

tality and that among miners the rates vary enormously, both with the kind of material mined and with the locality. The rates for tin, copper, and lead miners are very high, while coal miners show varying rates in different coal fields, but all low. This slight susceptibility of coal miners is attributable largely to the fact that they are a picked class of men, the work precluding the entrance of any who are not of a physique above the average.

It is significant of the improved conditions in textile factories that the 150,000 operatives have a death-rate from consumption of only 2.1 per 1000.

Most of the rates given in Table 14 indicate that the deaths of women engaged in gainful occupations are understated. This is even more apt to occur among women than among men, for the reason that when a girl or woman begins to lose health she can stop work more easily than a man, and that after doing so she more quickly ceases to identify herself with her occupa-

tion. The natural exit from her occupation being by marriage, not death, the proportion of women below forty-five years of age is considerably greater than the proportion of occupied men, in all occupations, except the two or three which are the resort of widows and of single women unexpectedly thrown on their own resources. With this large proportion at the ages when consumption is most prevalent it is improbable that the death-rates among occupied women are lower than they are among all women. The rate for servants is the only one which seems reasonable.

More valuable than the census figures, because the element of age is taken into account, are those which were presented by Mr. Frederick L. Hoffman, statistician of the Prudential Insurance Company, before the British Congress on Tuberculosis in 1900. Mr. Hoffman, from a tabulation of the experience of his company for three years, found that consumption caused the highest percentage of deaths among stone-workers, printers, glass-workers, brass-workers, bookkeepers, plumbers, salesmen, hatters, silk-workers, and cigarmakers. In all of these occupations over thirty-three per cent of all deaths were due to consumption. Between the ages of twenty-five and thirty-five the proportion was over half among stone-workers (64.5 per cent), glass-workers (58.7), hatters, bookkeepers, and printers.

Two objections might be urged against drawing conclusions from these figures: they represent a selected class of the population, and the numbers are comparatively small. They do, however, correspond with what would be expected from the characteristics of the occupations and the nature of consumption, and are therefore of value in the way of confirmation.

In the hope of throwing light on local conditions a tabulation by occupation, sex, age, and nationality has been made of the deaths in Manhattan and Bronx in 1902. The only comparison possible is of the deaths from consumption with all deaths in each occupation. The figures are too small to be regarded as representative. It is hard to decide just how small figures may be and still give a percentage which will justify



confidence. For this probably one hundred would be a sufficiently low minimum; but because that would cut out of consideration many important industries, the results are given for all occupations showing at least fifty deaths from all causes, with the warning that confidence placed in the percentages should be proportioned to the size of the figures on which they are based. Their chief value will be to arouse speculation and to start investigations. It may be only accident that of the sixty-five jewellers who died in New York in 1902 over thirty-eight per cent died of consumption; but even if the real proportion is somewhat lower, it is probably above the average for all men, and a search for the reasons of the condition indicated by the figures should have good results.

In the table (15) the total number of deaths from all causes and from consumption is given for men of fifteen years of age and over; percentages are given for two age-periods,—fifteen to forty-four years, and forty-five to sixty-four years; the occupations are arranged with reference to the importance of consumption at the age when it is the most serious problem. A comparison with the average for all men in the city at the same age is given in an additional column, in which each percentage is represented by a number showing its relation to the average percentage considered as 100. A 200 in this column would mean that in that particular occupation consumption caused twice as many deaths as the average proportion would call for, while a 50 would indicate only half as many.

It is proposed to make these figures a basis for investigation into the conditions in occupations that seem particularly in need of attention. Until that has been done it is useless to attempt to account in detail for the variations exhibited in this table. In some industries with an undue amount of consumption it will doubtless be found that the conditions under which the work is done are responsible for the excess; in others the average conditions may be good but some of the processes may unavoidably exhaust the vitality of the workman; in still others the fault may lie with neither work nor environment, but with the low standard of living of the men who engage in it.

TABLE 15.—PROPORTION OF DEATHS CAUSED BY CONSUMPTION AMONG MEN ENGAGED IN 51 OCCUPATIONS IN MANHATTAN AND BRONX, 1902

RANK ACCORD- ING TO PER- CENTAGE OF DEATHS CAUSED BY CON- SUMP- TION		OCCUPATION	15 YEARS OLD AND OVER		15-44 YEARS OF AGE				45-64 YEARS OF AGE				
			Deaths from All Causes	Deaths from Consumption	Number of Deaths		Percentage due to Consump- tion	Relation to Average Percent- age for City	Number of Deaths		Percentage due to Consump- tion	Relation to Average Percent- age for City	
					All Causes	Consumption			All Causes	Consumption			
15-44 Years of Age	45-64 Years of Age												
1	6	Jeweller, goldsmith, silver-smith.....	65	25	28	18	64.29	196	27	7	25.93	192	
2	7	Cabinet-maker, wood-carver.....	80	24	30	17	56.67	173	28	7	25.00	185	
3	36	Printer, compositor, type-setter.....	142	50	83	44	53.01	161	46	5	10.87	81	
4	1	Laundryman.....	84	41	52	24	46.15	141	31	18	54.84	407	
5	29	Shoemaker.....	149	28	39	18	46.15	141	61	11	18.33	136	
6	17	Machinist.....	144	37	60	26	43.33	132	60	11	18.33	136	
7	3	Stone-worker.....	75	24	30	13	43.33	132	35	10	28.57	212	
8	35	Bookkeeper.....	143	41	79	34	43.94	131	46	3	10.87	81	
9	23	Plumber, gas and steam fitter.....	148	49	101	43	42.57	130	39	6	15.38	114	
10	5	Musician.....	71	21	31	13	41.04	128	30	8	26.67	198	
11	24	Driver.....	604	220	475	194	40.84	124	157	24	15.29	113	
12	48	Clergyman, rabbi.....	51	4	10	4	40.00	122	27	0	0.00	—	
13	37	Porter.....	210	60	131	52	39.66	121	70	7	10.00	74	
14	28	Barber.....	88	27	58	23	39.66	121	22	3	13.64	101	
15	21	Mason.....	122	29	56	22	39.29	120	43	7	16.28	124	
16	20	Waiter.....	199	67	151	59	39.07	119	42	7	16.67	124	
17	12	Laborer.....	1881	499	977	337	38.59	118	680	139	20.44	152	
18	41	Watchman.....	122	19	34	13	38.24	116	60	5	8.33	62	
19	33	Clerk.....	688	203	474	181	38.19	116	163	19	11.66	86	
20	22	Peddler.....	184	40	68	25	36.76	112	95	15	15.79	117	
21	25	Painter, glazier, varnisher.....	295	74	145	53	36.55	111	119	18	15.43	112	
22	15	Cook.....	123	33	65	22	33.85	110	48	9	18.75	139	
23	9	Hostler.....	104	28	58	19	32.76	100	36	8	22.22	165	
24	31	Plasterer, decorator.....	69	15	38	12	31.58	96	24	3	12.50	93	
25	26	Butcher.....	176	38	93	28	30.11	92	61	9	14.75	109	
26	10	Salesman.....	243	60	133	40	30.08	92	91	19	20.88	155	
27	43	Saloon-keeper, bartender.....	207	47	144	43	29.86	91	54	4	7.58	56	
28	8	Iron-worker.....	56	15	37	11	29.73	91	17	4	23.53	174	
29	11	Baker, confectioner.....	152	34	68	20	29.41	90	64	13	20.79	154	
30	34	Tailor.....	532	94	246	71	28.86	88	182	20	10.99	81	
31	14	Longshoreman.....	80	19	49	14	28.57	87	25	5	20.00	148	
32	27	Cigarmaker.....	190	38	88	25	28.41	87	78	11	13.85	103	
33	19	Janitor.....	119	21	39	11	28.21	86	60	10	16.67	124	
34	4	Railroad employee.....	61	16	39	11	28.21	86	18	5	27.77	206	
35	18	Blacksmith.....	86	18	44	12	27.27	83	34	6	17.65	131	
36	30	Motorman, conductor.....	65	16	55	15	27.27	83	8	1	12.50	93	
37	49	Grocer.....	61	6	24	6	25.00	76	27	0	0.00	—	
38	13	Carpenter.....	393	55	99	24	24.24	73	130	26	20.00	148	
39	16	Coachman.....	121	23	63	15	23.81	73	43	8	18.60	138	
40	42	Merchant.....	468	43	111	25	22.52	69	219	18	8.22	61	
41	2	Fireman.....	84	19	51	10	19.61	60	28	9	32.14	238	
42	38	Teacher, author, journalist.....	74	7	22	4	18.18	55	35	3	8.57	64	
43	32	Manufacturer.....	64	6	11	2	18.18	55	34	4	11.76	87	
44	39	Engineer.....	213	25	105	19	18.10	55	71	6	8.45	63	
45	47	Agent, collector.....	153	10	42	7	16.67	51	89	3	3.37	25	
46	40	Contractor, builder.....	60	4	13	2	15.38	47	24	2	8.33	62	
47	45	Policeman.....	66	4	36	5	13.89	42	21	1	4.76	35	
48	44	Sailor.....	70	6	36	5	13.89	42	20	1	5.00	37	
49	50	Lawyer.....	99	5	29	4	13.79	42	33	0	0.00	—	
50	51	Physician, surgeon.....	80	2	21	1	4.76	14	34	0	0.00	—	
51	46	Broker, banker, official.....	179	6	46	2	4.35	13	90	4	4.44	33	
All Males, New York City.....					10,390	3412	32.84	100	7437	1003	13.49	100	

One feature of the table is worth mention even if its full significance is not yet clear, and that is the striking discrepancies between the ranks of many of the industries at the two age-periods given. Of the twenty-two occupations which stand above the average in regard to the amount of mortality due to consumption between fifteen and forty-five years of age, seven are below the average at the later years; and, conversely, of the twenty-eight above the average between forty-five and sixty-five, thirteen are below in the earlier period of life. In some cases, as, for example, among firemen, it seems probable that the high proportion among the older men may be evidence of the effect on the constitution of years of an exacting kind of work, while the same characteristic, by demanding a certain high standard of physical strength on entrance into it, keeps the percentage low among the younger men. In other cases natural selection brings about the opposite result, and shows the younger men susceptible to consumption, while the older ones are comparatively free from it. The occupation of watchman, for instance, is not apt to attract a strong, vigorous man under forty-five years of age, but it is adapted to the powers of those who are physically below par and is often sought for men in the incipient stage of consumption. And so the difference in personnel in this occupation above and below the age of forty-five is probably the chief explanation for the contrast in regard to tuberculosis, rather than any feature of the work itself. The class of clergymen barely passed the requirement of fifty deaths for admission to the list. It may be mere chance that among them consumption caused four of the ten deaths under forty-five, and not one of the other forty-one, but these figures correspond with the facts as observed in England.

Without undertaking further explanations, since they can be at best only suggestive speculations, the characteristics of an employment which tend to make consumption unusually prevalent in its ranks may be summarized as follows:

(1) A low rate of wages, entailing discomfort and privations in the home.

- (2) Insanitary conditions of place of employment.
- (3) Exposure to dust arising from marble, stone, plaster, wood, metals, or textiles.
- (4) Excessive physical exertion, or a continued constrained position.
- (5) Close confinement within doors.
- (6) Exposure to excessive heat.
- (7) Temptations to intemperance.
- (8) Long or irregular hours.

It is not claimed that the statistics available suggest or even prove the generalizations submitted, but they do at least give them verisimilitude.

#### DENSITY

The aggregation of population in cities, diminishing as it does the per capita allowance of sun and air, must tend to increase consumption.

In the cities of 8000 inhabitants and over in the registration states the mortality from consumption in 1900 was fifty-three per cent higher than in the rural districts. The towns of 25,000 inhabitants or more in the state of New York have a death-rate from this disease not far from twice as great as the rest of the state. Lagneau has shown that in France the mortality from tuberculosis varies directly according to the size of the city, from 490 deaths per 100,000 living in Paris to 181 in the ninety-five cities of less than 5000 inhabitants.

This strict correspondence between size and mortality would be expected only in an old country, comparatively uniform in the composition of its population, its industries, the development of its civic conscience, and its attitude toward sanitation. Mere size, the number of persons included within the municipal boundary, could not affect the health. In the United States, therefore, the number and variety of other factors prevent the relation noticed in France.

The tabulation of the 340 registration cities according to size (Table 16) shows, it is true, that the cities with a population of

over 500,000 have the highest mortality both from all causes and from consumption. These six cities have doubtless in the highest ratio to their population the so-called "slum" conditions which make for an abnormal amount of disease and death. The other groups follow, with no relation between their size and their rank according to death-rates. The most striking thing in the table is that the thirty-seven cities between 50,000 and 100,000 inhabitants rank second, having both a general death-rate and a consumption death-rate close to those

TABLE 16.—DEATH-RATES IN THE 340 REGISTRATION CITIES OF THE UNITED STATES, CLASSIFIED ACCORDING TO SIZE

Number of Cities	SIZE	Population of the Group	NUMBER OF DEATHS		DEATH-RATES PER 10,000 POPULATION		Percentage of all Deaths Due to Consumption	Rank According to Consumption Death-Rate
			From all Causes	From Consumption	From all Causes	From Consumption		
6	500,000 inhabitants and over.	8,074,561	157,494	18,036	195.1	22.3	11.45	1
13	200,000-500,000 inhabitants..	3,721,248	70,930	7,608	190.6	20.7	10.85	3
19	100,000-200,000 " ..	2,412,538	40,538	4,566	168.0	18.9	11.26	4
37	50,000-100,000 " ..	2,539,681	48,700	5,571	191.8	21.9	11.44	2
52	25,000-50,000 " ..	1,903,222	30,960	3,129	162.7	16.4	10.01	6
213	8,000-25,000 " ..	3,073,182	53,737	5,330	174.9	17.3	9.92	5
Total registration area.....		28,807,269	512,669	54,898	178.0	19.1	10.69	

of the six great cities. By combining groups 2 and 3 and groups 5 and 6, the cities assume the following rank from the standpoint of both death-rates:

- 1—Cities of 500,000 inhabitants and over.
- 2—Cities of 50,000 to 100,000 inhabitants.
- 3—Cities of 100,000 to 500,000 inhabitants.
- 4—Cities of 8000 to 50,000 inhabitants.

This invites seductively to the drawing of inferences not justified by the facts at command. If groups 2 and 3 could change places it would look as if the evil sanitary conditions popularly ascribed to city life were in direct proportion to the size of the cities,—that they are scarcely noticeable in towns of less than 50,000, and that they reach their maximum in the

largest cities. In groups as large as these the accidental varieties of industrial, climatic, and racial conditions may be disregarded on the ground that they cancel one another within the group. The only other factor to be considered, then, would be the agencies counteracting the evil tendencies of city life. Can these figures mean that in the United States cities are generally allowed to attain a considerable size, 100,000 or more, before the public realizes the housing problem, the drainage problem, the water and milk supply problems, the street-cleaning problem, and others, that have been growing up, and sees its responsibility for them? The intensity of the bad conditions in the six largest cities would explain their rank, without discrediting the efforts of the municipal government. But the main conclusion to be drawn, if the premises may be accepted, is that the small city of between 50,000 and 100,000 inhabitants is large enough to have its serious sanitary problems, and that it has not yet realized their gravity. These figures will have served their end if they add volume to the warning which has begun to sound, that the small city would do well to look at once to its housing conditions and other matters connected with the general health while it can do preventive and constructive work.

On account of their interest as facts, not for any value in throwing light on the influence of city conditions, the mortality rates are given for the twelve largest cities in the United States, from all causes and from consumption (Table 17 and Diagram X.).

Between the highest and the lowest death-rate from consumption, there is a difference of almost 150 per cent. The variations displayed in the diagram could be fully explained only by a careful investigation into such circumstances as the climatic and sanitary conditions of each city, the composition of its population as to race, sex, and age, the industrial situation, and the method of registering deaths. It is probable, however, that the large negro element in New Orleans and the Chinese population of San Francisco would go far toward accounting for their position at the head of the list. The rank

according to the consumption death-rate does not always correspond to its rank according to the general death-rate, New Orleans and Buffalo, in fact, being the only instances where it does. San Francisco and Pittsburg are, perhaps, the most notable examples of disparity between the two rates. In San Francisco, with a high mortality from consumption, the general death-rate is not much above the average. In the case of Pittsburg, which has a high general death-rate, but a very low mortality from consumption, pneumonia figures as the chief cause of death, and consumption causes less than seven per cent of the total number of deaths. There seems to be no relation between the death-rate from consumption and the size of the city.

TABLE 17.—MORTALITY RATES IN THE TWELVE LARGEST CITIES OF THE UNITED STATES, 1901

Rank According to Mortality from Consumption	CITIES	Death-rate per 1,000 from all Causes	Death-rate per 1,000 from Consumption	Per Cent of all Deaths Caused by Consumption	Rank According to General Death-rate	Rank According to Population, 1900
1	New Orleans.....	21.24	3.18	14.9	1	12
2	San Francisco.....	19.34	2.64	13.6	6	9
3	Boston.....	19.70	2.35	11.9	5	5
4	New York.....	20.00	2.30	11.5	3	1
5	Cincinnati.....	18.88	2.29	12.1	7	10
6	Philadelphia.....	18.26	2.23	12.2	8	3
7	Baltimore.....	19.96	2.16	10.8	4	6
8	St. Louis.....	17.73	1.88	10.6	9	4
9	<sup>1</sup> Chicago.....	16.21	1.78	11.0	11	2
10	<sup>1</sup> Pittsburg.....	20.01	1.36	6.8	2	11
11	<sup>1</sup> Cleveland.....	17.08	1.32	7.7	10	7
12	Buffalo.....	14.63	1.29	8.7	12	8

<sup>1</sup> Death-rates for 1900.

Density of population, however, is one of the most important factors in the prevalence of tuberculosis, and if statistics on this point were available, a direct correspondence would probably be seen to exist.

London statistics show that the consumption death-rate

varies according to the number of persons to a room, and in Dundee it has been found that it varies inversely as the number of rooms to an apartment. Dr. Körösi of Budapest found that consumption caused over twenty-two per cent of all deaths among the poor, but only sixteen per cent among the

*Death rates in the twelve largest cities of the United States  
1901*

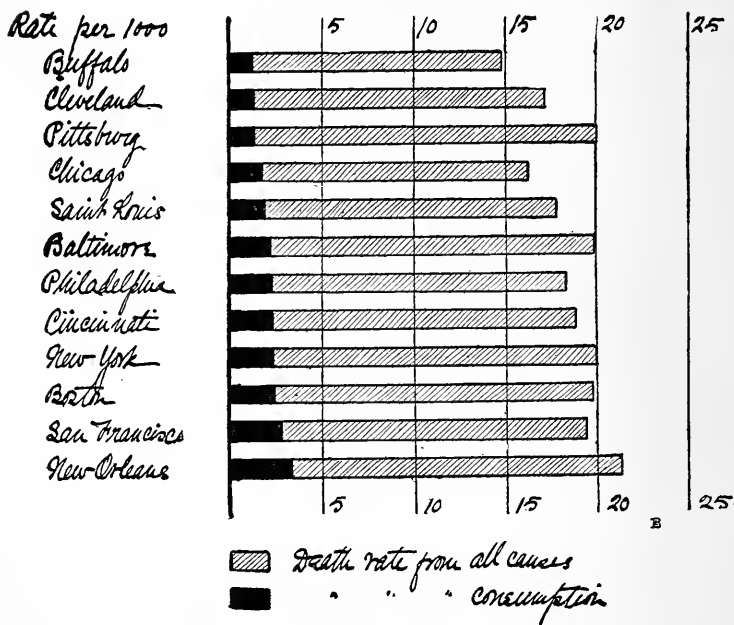


DIAGRAM X

well-to-do. While no such figures are available for an American city it is well understood that consumption is pre-eminently a disease of the tenements. This does not follow from mere density of population but from the attendant evils of poverty, ignorance, and carelessness, all of which operate to produce a physical condition predisposed to the disease, as well as to preserve rather than destroy the specific cause.



## HABITS AND SOCIAL CUSTOMS

Of almost equal importance with housing conditions and occupation in determining the prevalence of consumption are habits outside of working hours. Alcoholism is admitted by all authorities to be an important factor in predisposing to tuberculosis. Since this view has obtained credence the story of the sport-loving English gentleman, whose recovery was formerly attributed to the regular imbibing of seven tumblers of punch every night, is quoted as evidence of the value of duck-shooting and angling in the treatment of this disease. The susceptibility of cab-drivers to consumption is now explained, not by their exposure to the weather, but by the intemperance which characterizes them as a class. For frequenters of saloons the weakening effect of alcohol on the system is supplemented by exposure to a germ-laden atmosphere.

It has been estimated that the excessive use of alcohol triples the susceptibility to consumption. The effect of other forms of dissipation has not been stated with such precision, but it is none the less true that any habit that tends to lessen the vitality and impair the physical condition increases the mortality from consumption.

The question of amusement is also a most important one. If the New York printer, for example, spends his evenings in the park or in taking a long walk, and his Sundays and holidays in excursions to the sea shore or the country, he is doing much to lower the probabilities that he will succumb to the disease; if, as is the rule, such forms of recreation have no attraction in comparison with the saloon and the theatre, he can hardly hope to escape. The air in many dance halls and theatres where tenement dwellers seek their recreation is no less vitiated than that of the saloons. Out-door amusements would go far toward counteracting insanitary conditions of home and work-room.

## IV

### VARIATIONS IN PREVALENCE ACCORDING TO LOCALITY

#### IN THE UNITED STATES

The geographical incidence of consumption, far from introducing a new causal factor into the field, makes demands on all causes for an explanation of its variations. Each social phenomenon added to the list of circumstances which affect the prevalence of the disease takes away from natural and climatic conditions a corresponding part of the responsibility popularly assigned to them. Their influence can be justly estimated only when all the social factors can be eliminated.

The tendency among physicians is to assign to climate a less and less prominent place in the list of causes. Even if all investigations did not combine to support the belief that its influence is insignificant in comparison with that of social conditions, the tendency to disregard it would still be justifiable, since climate can be only slightly modified by man, and comparatively few persons are in a position to select the variety in which they live, while many of the social conditions found to be most potent factors are under his control.

The shaded map of the United States (Diagram XI.) shows the percentage of mortality due to consumption in each state. The ratio to the population would be a preferable basis of comparison in this connection, but such ratios are quite unreliable outside the nine registration states on account of the admittedly incomplete record of deaths. The percentage which deaths from consumption make of the total number of deaths is not equally unreliable, since there is nothing which would tend to make the ratio of omissions greater in one disease than in another. The proportion of deaths caused by any one disease is probably, therefore, approximately the same among all the deaths reported as it is among all the deaths that occurred. Diagram XII. arranges the states in order, from California with its 15.46 per cent to Utah, with only 4.64 per cent.

To account for all these variations, or even fully for any one

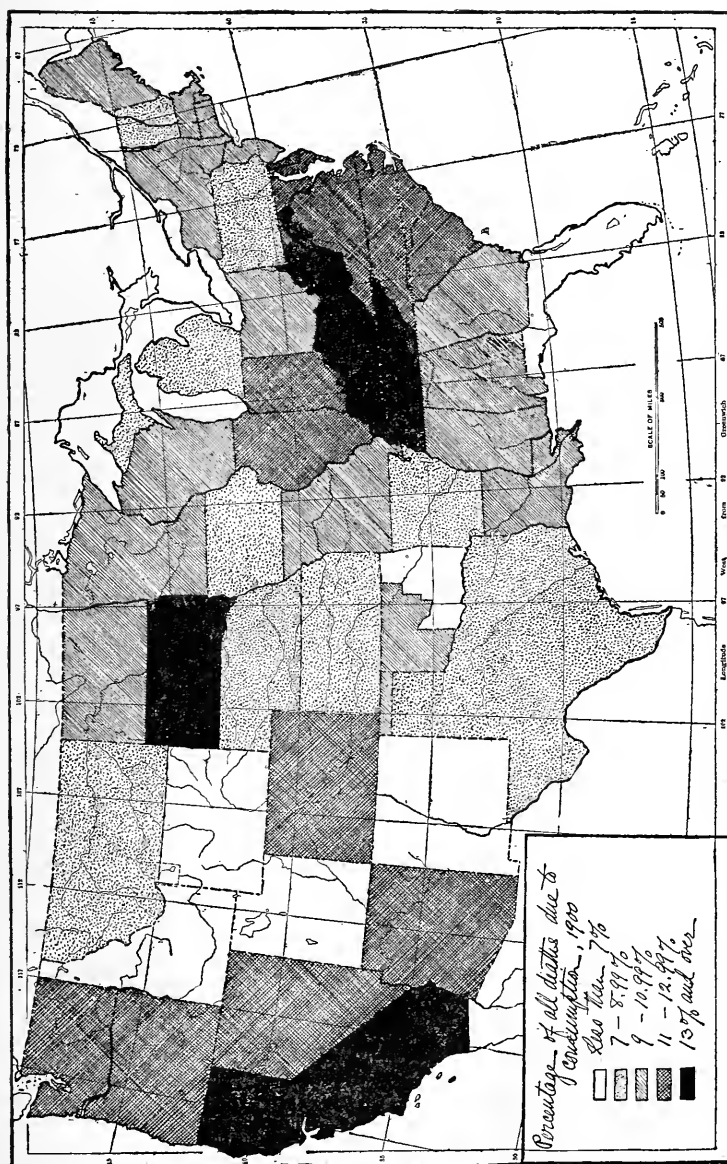


DIAGRAM XI

PROPORTION OF DEATHS CAUSED BY CONSUMPTION, 1900

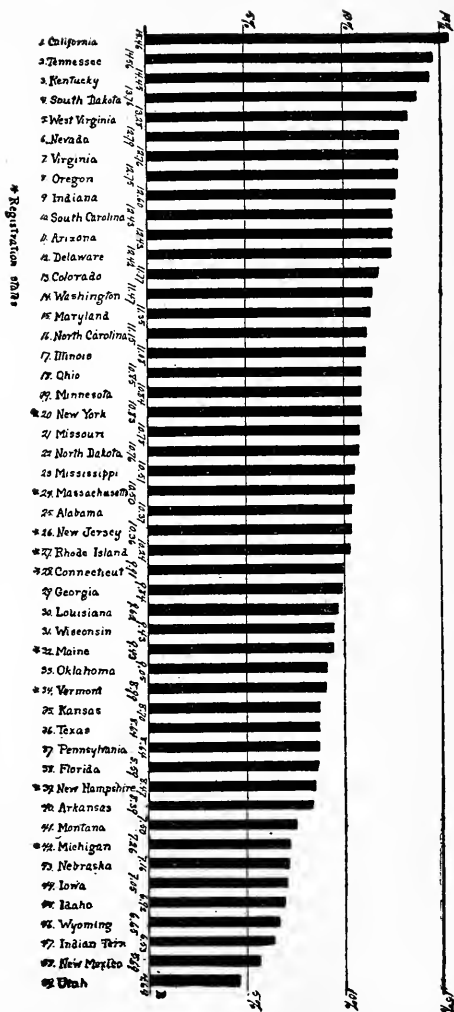


DIAGRAM XII

of them, would require intimate acquaintance with local conditions and medical science, and would fill volumes. It would entail explanations for the prevalence of all other diseases, as well, since an abnormal amount of heart disease, for instance, or malarial fever, would lower the percentage for consumption.

One thing at least is evident. In all the states which have had the reputation of a favorable climate, consumption has an importance among causes of deaths far above its average importance in the country. The healthful natural conditions bring this about in two ways: they keep the general mortality low, thus giving consumption a chance for prominence; and the invalids attracted from other parts of the country raise the proportion, both by their own deaths and by spreading infection. Davos-Platz, in Switzerland, is the classic example of a naturally favored spot which has become infected by outsiders. Colorado and Southern California are showing evidences of concern about their situation. It is the scattered, independent invalids who do the harm; a properly conducted sanatorium is innocuous.

Aside from the possession of a favorable climate, the characteristics which tend to raise the percentage are the predominance of manufacturing over agricultural pursuits; a large number of cities; a relatively large proportion of men and of both men and women in the middle age-periods; large elements of such races as are peculiarly susceptible to this disease. The states at the head of the column have a varying number of these characteristics in varying intensity, while a composite of those at the other end would bring out the opposite type.

For purposes of reference Table 18 has been compiled, giving for each state as many of the co-operating factors as can conveniently be expressed in percentages.

TABLE 18.—IMPORTANCE OF VARIOUS ELEMENTS IN THE POPULATION OF THE STATES AND TERRITORIES OF THE UNITED STATES, 1900

	STATES ARRANGED AS IN DIAGRAM XII	PER CENT OF URBAN <sup>1</sup> POPULATION	PER CENT OF MALES	PER CENT OF FOREIGN- BORN WHITE	PER CENT OF COLORED
1	California.....	43.7	55.3	21.3	5.5
2	Tennessee.....	13.4	50.5	0.9	23.8
3	Kentucky.....	16.9	50.8	2.3	13.3
4	South Dakota.....	2.6	53.8	22.0	5.2
5	West Virginia.....	7.7	52.1	2.4	4.5
6	Nevada.....	—	60.5	20.3	16.4
7	Virginia.....	14.7	49.9	1.0	35.7
8	Oregon.....	23.9	56.3	13.0	4.6
9	Indiana.....	24.2	51.1	5.6	2.3
10	South Carolina.....	7.5	49.6	0.4	58.4
11	Arizona.....	—	58.4	18.2	24.4
12	Delaware.....	41.4	51.0	7.5	16.6
13	Colorado.....	38.1	54.7	16.8	2.0
14	Washington.....	31.9	58.7	19.7	4.2
15	Maryland.....	46.9	49.6	7.9	19.8
16	North Carolina.....	5.1	49.6	0.2	33.3
17	Illinois.....	47.1	51.3	20.0	1.8
18	Ohio.....	38.5	50.6	11.0	2.3
19	Minnesota.....	26.8	53.2	28.8	0.8
20	New York.....	68.5	49.7	26.0	1.5
21	Missouri.....	30.8	51.4	6.9	5.2
22	North Dakota.....	3.0	55.6	35.3	2.3
23	Mississippi.....	2.6	50.4	0.5	58.7
24	Massachusetts.....	76.0	48.7	29.9	1.3
25	Alabama.....	7.3	50.1	0.8	45.3
26	New Jersey.....	61.2	50.0	22.8	3.8
27	Rhode Island.....	81.2	49.1	31.2	2.2
28	Connecticut.....	53.2	50.0	26.1	1.8
29	Georgia.....	11.0	49.8	0.6	46.7
30	Louisiana.....	22.8	50.3	3.7	47.2
31	Wisconsin.....	30.7	51.6	24.9	0.5
32	Maine.....	23.7	50.5	13.4	0.3
33	Oklahoma.....	5.0	53.8	3.9	7.7
34	Vermont.....	11.2	51.0	13.0	0.3
35	Kansas.....	14.0	52.3	8.6	3.7
36	Texas.....	11.3	51.8	5.8	20.4
37	Pennsylvania.....	45.5	50.8	15.6	2.5
38	Florida.....	15.0	52.1	3.7	43.7
39	New Hampshire.....	38.6	49.9	21.4	0.2
40	Arkansas.....	5.4	51.5	1.1	28.0
41	Montana.....	27.0	61.6	25.6	7.0
42	Michigan.....	30.9	51.6	22.3	0.9
43	Nebraska.....	15.8	52.9	16.6	0.9
44	Iowa.....	16.8	51.8	13.7	0.6
45	Idaho.....	—	57.7	13.5	4.5
46	Wyoming.....	24.1	62.9	17.9	3.8
47	Indian Territory.....	—	53.3	1.2	22.8
48	New Mexico.....	—	53.4	6.8	7.7
49	Utah.....	25.2	51.2	19.1	1.5

<sup>1</sup> "Urban" includes cities of 8,000 inhabitants and over.

IN NEW YORK CITY

The wards of every city show variations as wide as do the states of the country.

TABLE 19.—DENSITY OF POPULATION AND DEATH-RATES FROM CONSUMPTION IN MANHATTAN, BY WARDS, 1890 AND 1900

WARD	POPULATION, 1900	DENSITY OF POPULATION				MORTALITY FROM CONSUMPTION			
		Number of Persons per Acre		Increase per cent	Decrease per cent	Death-rate per 100,000 Population		Increase per cent	Decrease per cent
		1890	1900			1890 <sup>1</sup>	1901		
1	9,516	84.53	72.31		14.44	641.38	459.60		28.34
2	1,488	11.47	18.37	60.17		776.26	255.43		67.09
3	1,797	39.63	18.92		52.23	458.34	241.11		47.39
4	19,554	214.57	235.59	9.80		657.37	506.25		22.99
5	8,298	73.72	49.39		33.00	509.94	490.81		3.75
6	20,004	297.73	267.11		10.29	575.83	517.98		10.04
7	89,237	289.73	478.10	65.02		373.15	155.96		58.20
8	29,059	170.60	158.79		6.92	499.74	319.06		36.16
9	59,650	170.15	186.48	9.60		388.55	403.36	3.81	
10	71,879	523.60	653.45	24.80		306.80	201.02		34.48
11	99,144	384.83	515.30	33.90		327.58	136.10		58.45
12	476,602	51.73	100.95	95.15		286.70	187.23		34.69
13	64,117	428.82	599.22	39.74		284.12	102.28		64.00
14	34,035	292.65	354.53	21.14		504.61	267.62		46.96
15	24,066	133.78	126.73		5.27	436.40	288.37		33.92
16	52,808	140.79	151.31	7.47		377.10	321.30		14.80
17	130,796	321.87	408.10	26.79		359.19	239.93		33.20
18	61,325	145.30	140.83		3.08	391.16	346.88		11.32
19	257,448	178.21	195.37	9.63		280.77	256.91		8.50
20	89,798	189.93	203.68	7.24		430.86	376.06		12.72
21	60,211	153.33	146.50		4.45	373.38	408.91	9.51	
22	189,261	129.95	160.83	23.76		319.52	270.21		15.43
Manhattan	1,850,093	128.29	165.32	28.86		341.00 <sup>2</sup>	250.00 <sup>2</sup>		26.69 <sup>2</sup>

<sup>1</sup> Average for the six years ending May 31, 1900. U. S. Census, 1890, *Vital Statistics of New York and Brooklyn*, pp. 250, 251.

<sup>2</sup> Manhattan and Bronx.

The table for Manhattan (19) shows for each ward the

density and the consumption death-rate and the increase or decrease in both respects since 1890. The comparison of the rates now with those ten years ago will be discussed in another connection.

The maps (XIII.) show the relation between density of population and death-rate from consumption. They reveal an anomalous situation, which, if passed without comment, would surely destroy all credence in certain assertions that have been made in the foregoing pages. In the face of this testimony it requires some temerity, and a mind *sibi conscius recti*, to repeat that density of population is a potent factor in the prevalence of tuberculosis. Incontrovertibly it is, and, "other things being equal," it would explain the variations in any city. But "other things" have a way of never "being equal," and in New York City they develop their characteristic inequality to the highest degree.

The correspondence which would be expected is found, to be sure, in a very general comparison of the upper and lower sections of the city; in both maps all the heavy shading is below Fortieth Street. But going farther, and taking the lower half, ward by ward, the alternatives present themselves of denying to density any influence whatever or of concluding that it is a powerful advantage. It sounds paradoxical, but doubtless if it were possible to go still farther and compare smaller areas than wards, some rational relation would be apparent. There are other things to be said in explanation of this lack of correspondence between density and death-rate: first, that in many of the down-town wards, where the tenements are being displaced by business, the actual density of the part of the ward that is used for residence purposes is far greater than is indicated by the average number of persons per acre; and second, and most important, that the racial factor, with all that it implies of social and industrial characteristics, overshadows the influence of density.

It is the large Hebrew element in the tenth ward, for example, which gives this notoriously congested spot a comparatively low rate of tuberculosis. For the same reason



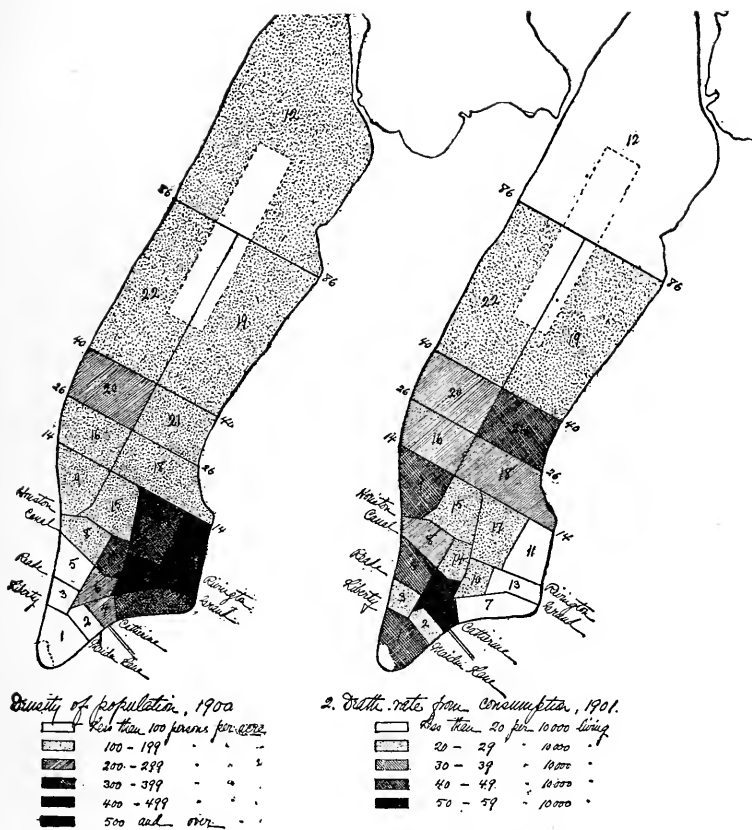


DIAGRAM XIII. Manhattan by Wards

the seventh, eleventh, and thirteenth, which rank next the tenth in density, have the very least consumption. In the first ward, where the average density per acre is low, the density per room is without doubt very high, since much of its area is occupied by warehouses and other buildings devoted to business purposes. The houses occupied as dwellings are old and unimproved. This is the site of the Syrian colony ; the other people are chiefly Irish. These are the most glaring discrepancies between density and death-rate.

The reasons for the high consumption rates in the sixth and fourth wards are not far to seek. The sixth contains Chinatown, and the rest of the ward is made up chiefly of solid tenement blocks of the same general type as the two that were razed some ten years ago in Mulberry Bend. The fourth ward, where consumption is almost as bad, is one of the oldest and most insanitary districts in the city. The main element in the population, moreover, is the lowest type of Irish-Americans, whose physical constitutions are weakened by excesses of all sorts on their own part and that of their parents. Housing conditions, together with a considerable Irish element probably have much to say in the ninth and twenty-first wards ; and there are large negro colonies in the sixteenth and twentieth.

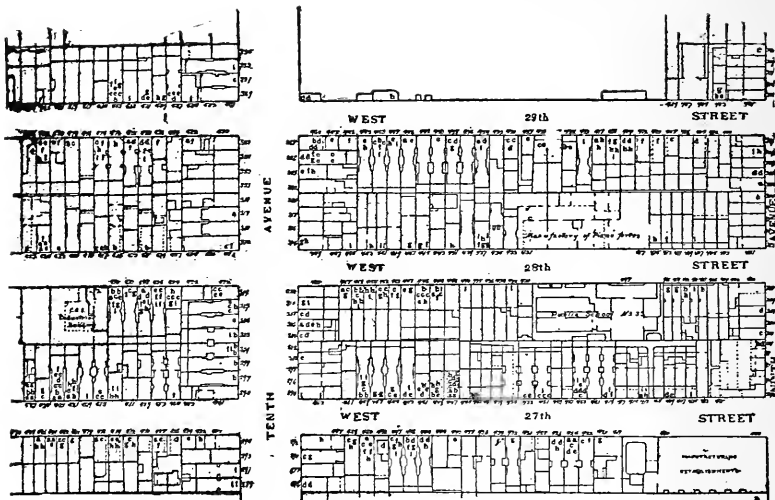
These are only a few suggestions : sufficient data for authoritative explanations do not yet exist. The records of the Tenement House Department, if the present system is continued, will within a few years supply many of the deficiencies.

In New York City a system of voluntary notification of living cases of tuberculosis was instituted by the Department of Health in 1894. Since 1897 all institutions and physicians have been "required" to report such cases. The reports from institutions are practically complete, and the compliance of physicians, though still far from universal, is steadily increasing. From this registration of living cases and from the records of deaths, we find that not only is consumption more prevalent in certain parts of the city than in others, but that

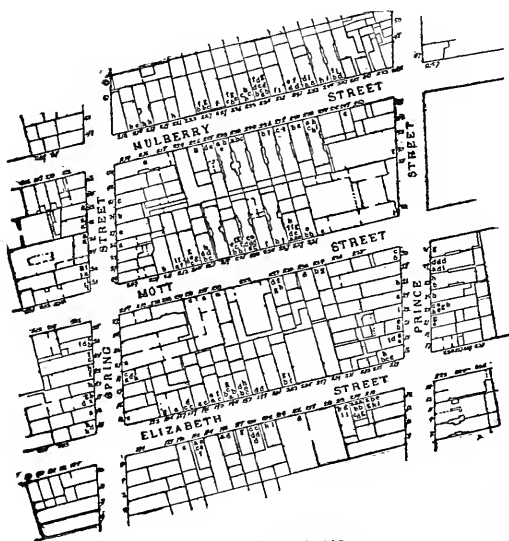
tinct national type, and has had the same racial characteristics for at least the last ten years. This does not mean that all the cases noted in the Italian district were Italians, but that in

DIAGRAM XIV

DIAGRAM XV



IRISH  
DIAGRAM XVI



ITALIANS  
DIAGRAM XVII

all probability most of them were. In a rough way the number of cases on these maps varies according to the death-rate by nationality, the Chinese district being far and away the worst of all, while the Hebrew section shows only a few cases. Each letter on these maps represents one case of consumption reported to the Health Department since 1894; *a* represents a case in 1894, *b* a case in 1895, and so on to *i*, a case in 1902. The record of another block, one in the worst Irish district, is displayed in the same way in connection with Mr. Poole's account of *The Plague in its Stronghold*.

#### HEBREWS

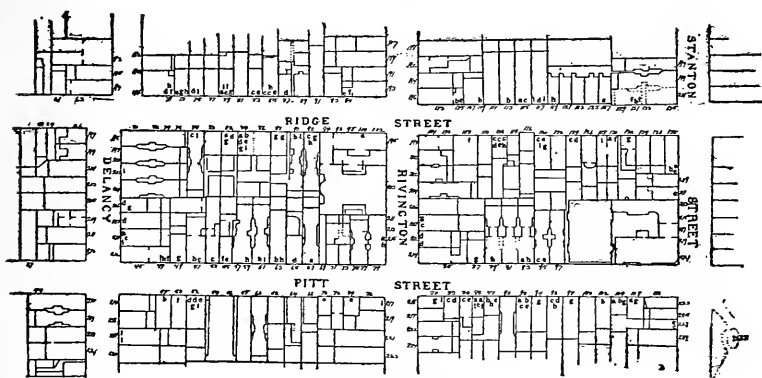


DIAGRAM XVIII

One house in Chinatown has a record of thirty-seven cases in the nine years; another of twenty-five; still another of nineteen. A house in the Syrian quarter shows thirteen cases. There are sixteen houses in a single block in the fourth ward, a district formerly frequented by Irish, now being displaced by Italians, from which 123 cases have been reported since 1894. While the recurrence of cases of tuberculosis in the same house is presumptive evidence of house infection, still the burden of proof rests on scientific experiments. Experiments proving the virulence of dust taken from apartments that had been occupied by consumptives have been made by many scientists in

many countries. Famous examples of infected institutions are afforded by the health statistics of the Catholic Nursing Orders in Prussia and of insane asylums and prisons in the United States and Europe, and many physicians have recorded their experience of individuals or families attacked by phthisis, when the disease could be attributed to no other cause than the occupancy of rooms which had been infected by a consumptive.

The fact of house infection has been proved. Its significance is felt as yet only vaguely. If it were fully realized a frequent, thorough cleaning of every apartment occupied by a consumptive would be insisted on. The thought that the germs of tuberculosis lurking in crevices of woodwork and pores of plaster are threatening the health of one family for two years or more is sufficiently disquieting. But in the tenements, where the mobility of population is so great that a hundred persons may easily occupy the same rooms in the course of two years, the danger to the public from house infection assumes appalling proportions.

## V

### VARIATIONS IN THE RATE OF IMPROVEMENT BETWEEN 1890 AND 1900

Conspicuous as this disease is among the causes of mortality, a comparison of the death-rate now with that of twenty or thirty years ago, or even ten, shows a decided improvement.

TABLE 20.—DECREASE IN GENERAL AND CONSUMPTION DEATH-RATES IN THE REGISTRATION AREA, 1890-1900

	RATES PER 10,000 POPULATION		PER CENT OF DECREASE
	1890	1900	
General death-rate.....	196.5	178.0	9.4
Death-rate from consumption.....	24.5	19.1	22.4

The general mortality rate is also falling, and this is more significant when it is remembered that the registration of deaths was far less complete at former census years than in 1900, and that the improvement in the accuracy of the records would tend to raise the death-rate. Between 1890 and 1900 the general death-rate in the registration area (see Table 20) fell 9.4 per cent. The decrease in the death-rate from consumption was out of all proportion to this, being 22.4 per cent. The comparison suggests either that special causes have been at work to reduce the amount of consumption, or that consumption is a disease peculiarly susceptible to every improvement in sanitary conditions. Both explanations bear inspection. Doubtless the education of the popular mind in regard to the real nature of consumption, which has been going forward incidentally through the general diffusion of scientific knowledge, as well as by the specific efforts of several societies and some Boards of Health, has had its influence. The advance in professional knowledge about methods of treating this particular disease, and the increased hospital and sanatorium facilities for sufferers from it, are other factors. But it is also probable that every effort for more healthful conditions reduces the death-rate from consumption more than that from any other disease of adult life, and that even measures directed specifically against some other disease, by raising the general average of health and vitality, contribute to the same end.

Just as consumption is not distributed impartially among all elements in the population, so the decrease in the death-rate is not going on uniformly in these elements. The rate of improvement varies, like the prevalence of the disease, with age, sex, and locality, and probably, though there are no figures to substantiate the assumption, also with nationality and occupation. In these variations are to be found both indications as to where the most vigorous action is called for and ground for the hope that all effort will be worth while.

It is seen from Table 21 (Diagram XIX.) that the rate of improvement between 1890 and 1900 was greater by five per cent

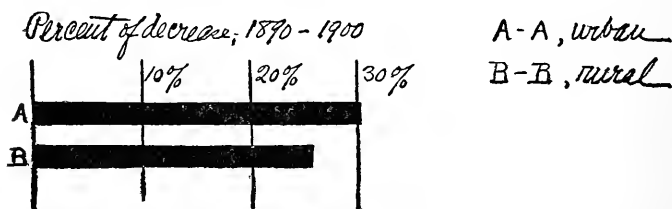
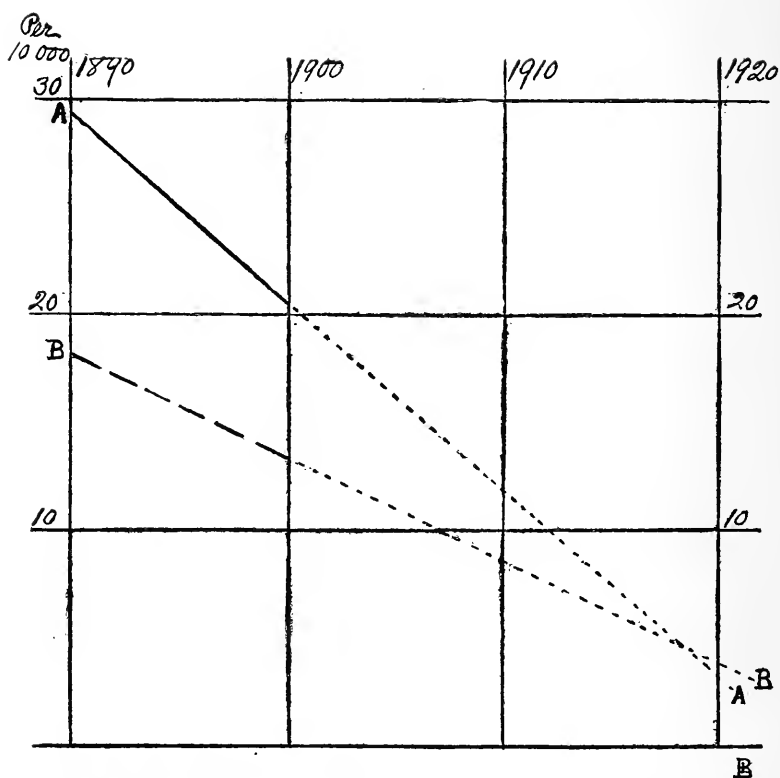


DIAGRAM XIX. Death-Rate from Consumption



in the cities than in the rural part of the registration area. This means that if the same rate of decrease should go on in both sections until 1920 the death-rate would then be higher in the country than in the cities. The explanation is found in

TABLE 21.—DECREASE IN CONSUMPTION DEATH-RATE IN THE URBAN AND THE RURAL POPULATION OF THE REGISTRATION AREA, 1890-1900

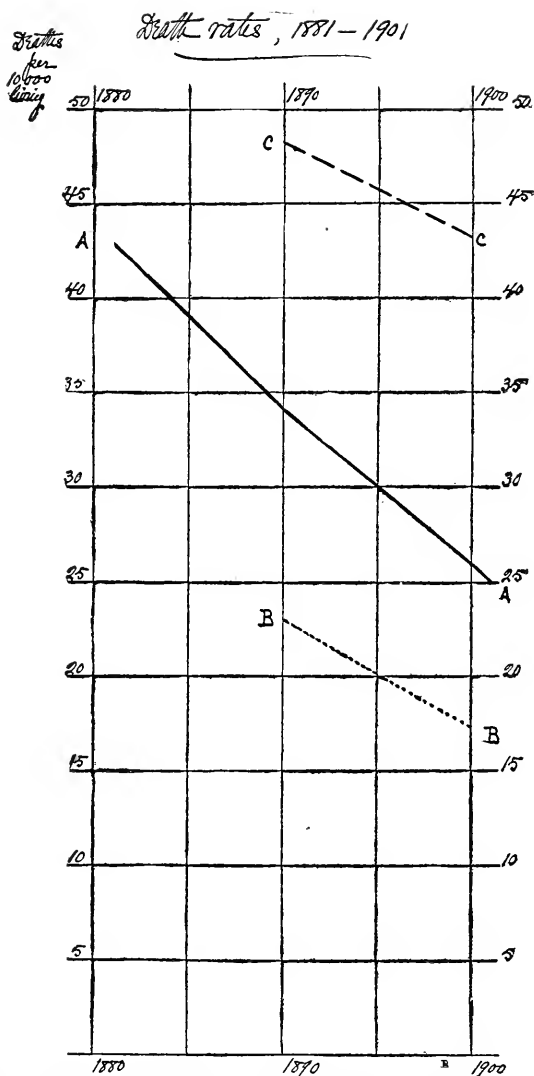
	DEATH-RATES PER 10,000 POPULATION		PER CENT OF DECREASE
	1890	1900	
Registration cities.....	29.4	20.5	30.22
Rural part of registration states .....	18.1	13.4	25.91

the awakening of the municipal conscience to its responsibilities in the matter of the public health. It is pleasant to contemplate that in the cities, where the rate is highest, it is falling the most rapidly. But the situation does not justify an untroubled complacency; it holds the warning that a passive attitude toward this serious problem cannot be maintained with impunity by even small towns and country districts.

The next table (22) and diagram (XX.) are concerned with New York City. As would be expected from the foregoing

TABLE 22.—DEATH-RATES IN NEW YORK CITY AND IN THE UNITED STATES IN CERTAIN YEARS BETWEEN 1881 AND 1902

YEAR	DEATH-RATES PER 10,000 IN MANHATTAN AND BRONX		DEATH-RATES PER 10,000 FROM CONSUMPTION IN THE UNITED STATES
	Consumption	Bronchitis and Pneumonia	
1881	42.7	—	—
1890	34.1	48.4	23.0
1900	25.7	43.2	17.4
1902	22.5	—	—



A-A. Consumption in Manhattan and the Bronx, 1881-1901

B-B. " " the United States, 1890-1900.

C-C. Pneumonia and bronchitis combined in Manhattan and the Bronx, 1890-1900.

DIAGRAM XX

comparison of cities in general with rural districts, the decrease in New York proper, the most essentially urban spot in the United States, is greater than the decrease in the country as a whole. The third line in the diagram was added in consideration of the claim frequently made, and discussed in the early pages of this report, that the decrease in the death-rate from consumption is largely a matter of false registration, and that it is found to be counterbalanced by an increase in the death-rates from pneumonia and bronchitis. These rates, too, it is evident, are decreasing, and that fast enough to make it necessary to look elsewhere than to false records for a complete explanation of the improvement in regard to tuberculosis. The rate of decrease in New York has been unusual, even admitting that it has not been quite so great as the figures indicate, and there are enough conspicuous reasons for it on the surface to arouse disappointment that it was not still greater.

Since 1890 there has been a decided improvement in the general sanitary condition of the city: the streets now are actually cleaned; several small parks have been introduced in the most crowded districts, displacing some of the worst tenement blocks; recreation piers have been built; the milk supply has been brought under supervision; medical inspection has been established in the public schools; a corps of physicians under the direction of the Board of Health visits the tenements systematically every summer. The work of the Tenement House Department, by far the most important new influence on the general sanitary condition, began in 1902, and its effect is therefore only beginning to be felt. Besides the municipal activities there has been an enormous development of private organizations which concern themselves, directly or indirectly, with the health of the poor. All of these efforts for improving the general health increase the average power of resistance to the tuberculosis germs.

There has also been evolved by the Department of Health, under the direction of Dr. Hermann M. Biggs, a system for reducing the danger of infection by destroying the germs.

In 1889 the consulting pathologists of the Board of Health, Dr. Prudden, Dr. Loomis, and Dr. Biggs, submitted a report on the causation and prevention of pulmonary tuberculosis, with suggestions as to the most profitable lines of municipal intervention. It seems curious, now that bovine tuberculosis is regarded as a comparatively unimportant source of infection, that the first result of this report was to convince of the necessity for controlling the milk and meat supply.

In 1894 the other recommendations, with additions, were put into effect. The registration of living cases was begun by respectfully requesting physicians, and requiring institutions, to report all cases; later, in 1897, it was made the "duty" of physicians. Compliance has been secured from institutions by following them up with postals and inspectors. Circulars were sent at the beginning to all the physicians in the city, calling attention to the new requirement; an increasing observance of it is secured from them by sending a minatory letter to every physician who reports a death from tuberculosis not previously registered, asking how it happened, and leaving the impression that the omission would better not occur again. In 1894, too, the systematic distribution of circulars of information to consumptives was begun. The circulars were in simple language, in English on one side, with a German, or Italian, or Yiddish translation on the obverse. They have been distributed in the tenements ever since, at the rate of 20,000 to 50,000 per year, by the medical inspectors.

Out of respect to the wishes of physicians, and on the presumption that they will give their patients all necessary instruction, no inspection is made of private cases reported. An inspector is sent to every address reported by an institution to give instructions, in case of a living patient, about the care of the sputum; in case of a death or a removal, to make "such recommendations as seem to him necessary to render the habitation free from danger of infection." When the inspector recommends renovation, an order is issued on the landlord: new tenants are not allowed to move in until the order has

been complied with. At present either renovation is ordered, or the premises are disinfected with formaldehyde and the bedding with steam after every death or removal. The work

TABLE 23.—DEATH-RATE, NUMBER OF DEATHS, AND OTHER DATA CONCERNING TUBERCULOSIS IN THE CITY OF NEW YORK FROM 1881 TO 1902

I.—MANHATTAN AND THE BRONX

Year	General Population	Total Deaths from All Causes	General Death-Rate	Total Deaths from Tuberculosis	Death-Rate All Tubercular Diseases	Deaths from Phtisis	Deaths from Other Tubercular Diseases	Per Cent of All Deaths Caused by Tuberculosis	Death-Rate Phtisis	Total Number of Cases of Tuberculosis Reported, including Duplicates	Duplicates	Number of Specimens of Sputum Examined
1881	1,244,511	38,624	31.04	6,123	4.92	5,312	811	15.85	4.27			
1882	1,280,857	37,924	29.61	6,052	4.72	5,247	805	15.06	4.10			
1883	1,318,264	34,011	25.80	5,943	4.51	5,200	653	17.47	4.01			
1884	1,356,764	35,034	25.82	6,039	4.45	5,235	804	17.28	3.86			
1885	1,396,388	35,682	25.55	5,945	4.26	5,106	749	16.66	3.72			
1886	1,437,170	37,351	25.99	6,349	4.42	5,477	872	16.99	3.81			
1887	1,479,143	38,933	26.32	6,007	4.06	5,260	747	15.43	3.56			
1888	1,522,341	40,175	26.39	6,073	3.99	5,260	813	15.12	3.46			
1889	1,566,801	39,679	25.32	6,041	3.86	5,179	862	15.22	3.30			
1890	1,612,559	40,103	24.87	6,409	3.97	5,492	917	15.08	3.41			
1891	1,659,654	43,659	26.31	6,109	3.56	5,160	949	13.99	3.11			
1892	1,708,124	44,329	25.95	6,061	3.55	5,033	1,028	13.67	2.95			
1893	1,758,080	44,486	25.30	6,163	3.51	5,124	1,039	13.85	2.91			
1894	1,809,353	41,175	22.76	5,720	3.16	4,658	1,062	13.89	2.57	4,166		511
1895	1,873,201	44,420	23.18	6,283	3.35	5,205	1,078	14.47	2.78	5,824		1,147
1896	1,906,139	41,622	21.84	5,920	3.11	4,994	932	14.24	2.62	8,334		1,850
1897	1,940,553	38,877	20.03	5,791	2.98	4,843	948	14.89	2.50	9,735		2,703
1898	1,976,527	40,438	20.46	5,901	2.99	4,957	944	14.59	2.51	10,798	2,239	2,920
1899	2,014,330	39,911	19.81	6,209	3.08	5,238	971	15.56	2.60	10,484	2,472	3,115
1900	2,053,979	43,227	21.04	6,179	3.01	5,278	901	14.29	2.57	9,639	2,436	3,512
1901	2,095,686	43,307	20.66	6,049	2.89	5,233	816	13.07	2.50	12,135	3,005	4,397
1902	2,139,632	41,704	19.49	5,744	2.68	4,893	851	13.77	2.29	13,383	3,738	4,631

II.—GREATER NEW YORK

Year	General Population	Total Deaths from All Causes	General Death-Rate	Total Deaths from Tuberculosis	Death-Rate All Tubercular Diseases	Deaths from Phtisis	Deaths from Other Tubercular Diseases	Per Cent of All Deaths Caused by Tuberculosis	Death-Rate Phtisis	Total Number of Cases of Tuberculosis Reported, including Duplicates	Duplicates	Number of Specimens of Sputum Examined
1898	3,272,418	66,224	20.26	9,265	2.69	7,724	1,541	13.97	2.25			3,945
1899	3,356,722	65,344	19.47	9,575	2.70	8,016	1,559	14.05	2.26			4,500
1900	3,444,675	70,872	20.57	9,630	2.80	8,154	1,476	13.59	2.37	14,433	2,456	5,289
1901	3,536,517	70,717	20.00	9,389	2.65	8,135	1,254	13.28	2.30	17,588	4,191	6,744
1902	3,632,501	68,112	18.75	8,883	2.45	7,571	1,312	13.44	2.08	16,614	4,268	7,820

begun by the Board of Health in 1894 included also arrangements for the free bacteriological examination of sputum, in order that physicians might be facilitated in their diagnosis. In 1902, 7820 specimens were examined. Table 23, which has just been published by the Department of Health, gives in

compact form a comprehensive view of the course of the death-rate and the increase in registration and bacteriological work.

In 1896 the system was completed by the enactment of an ordinance against indiscriminate expectoration. This, the first of its kind in America, was supplanted by a set of resolutions adopted at a meeting of the Board of Health in June, 1902, in consequence of a communication from Dr. Biggs.

By these resolutions, spitting is prohibited on any sidewalk; on the floor of any common hall in any tenement-house; of any common hall or office in a hotel or lodging-house; of any theatre, or of any building in which there is a public assemblage of people, or upon the floor of any public conveyance, or of any ferry-house, depot, station platform, or stairs of any elevated railroad or other common carrier. Spitting into the street from any public conveyance is also prohibited. The resolutions require that copies be displayed in "sufficient number" in all places affected by the new rules, and that the owners or managers of such places provide "sufficient and proper receptacles for expectoration, and also . . . provide for the cleansing and disinfection of said receptacles at least once every twenty-four hours." The providing of "proper receptacles for expectoration," in the proportion of one for each two persons, is also made mandatory on every corporation or person engaged in the manufacture of cigars, cigarettes, or tobacco, or conducting the business of printing, when ten or more persons are employed on the premises.

The only public places where expectoration may now be deposited with the sanction of the law are the streets between the curbs, and the walls, ceilings, and furniture of buildings and conveyances. Sputum on the street beyond the sidewalk, where it is exposed to the action of the sunlight, is regarded by Dr. Biggs as an inconsiderable source of danger. That the explicit inclusion of walls and furniture has been found not unnecessary is evidenced by the phrasing of the Cambridge regulation, in which "any other part" of a

public conveyance is declared taboo as well as the floor and platform.

The effect which a rigid enforcement of these resolutions would have in diminishing tuberculosis is no less patent than the advantage from an æsthetic standpoint. Unfortunately the conspicuous placards have still too little deterrent effect, and arrests are made only spasmodically.

The strong point in the New York system is its educational feature. The inspectors often find, on visiting a new case, that the general principles are already understood. The following postal, received at the Health Department from an East Side tenement, gives evidence of an accurate idea of the cause of consumption, as well as of society's responsibility in regard to its prevention:

"SIRS:

"A tenent by the name of D—— at the premises of —— A—— Street, room ——, has a boarder by the name of A—— B—— who has consumption. This man where he goes spits. And the party he boards at has six children. Please see that he is taken out. By so doing oblige,

"NEIGHBOR."

There is still a third explanation for the unusual decrease in the consumption death-rate in New York City. This will take some of the glory from the two already discussed,—the general sanitary improvement, and the specific measures of the Board of Health against consumption—since it is a circumstance quite outside the influence of the city government or of private philanthropy. It depends, in fact, on nothing less remote than the economic and social conditions of Europe and the United States and our hospitable attitude toward immigrants; and it is the change that has resulted in the racial composition of New York's population from the changes in the character of our immigration. It happens that the nationalities which are pouring into the United States are the very ones least subject

to tuberculosis. The Italians, Russians, Hungarians, and Poles, who have the lowest death-rates from consumption, formed only 7.37 per cent of the population of the city in 1890. In 1900 their number was more than three times as large and amounted to 16.34 per cent of the population. The proportion of the peoples whose death-rate from consumption is higher than that of the native white population of native parentage has correspondingly decreased, so that in 1900 they formed only 45.8 per cent in comparison with 56.6 per cent in 1890. The change in the relative size of the two groups has been going on since 1900 even more rapidly. This alone would operate to lower the amount of tuberculosis in the city. That some part of the reduction in the death-rate from consumption, even if it cannot be exactly computed, is thus attributable to immigration, must be conceded. Evidently the influx from southern and eastern Europe is not to be deprecated on the ground that it intensifies and complicates this problem.

In this connection reference should be made again to Table 19, in which a comparison of 1901 with 1890 is made by wards. The factor of nationality is of importance. Without recourse to this explanation it would be hard to understand why in the seventh ward, where the density has increased 65 per cent, more than in any other ward below Eighty-sixth Street, the consumption death-rate has decreased 58 per cent. But the people who have been crowding into this already overcrowded district, as well as into the eleventh and thirteenth wards, where the decrease in consumption has been even more remarkable, are chiefly Russians, Roumanians, and Poles. It is the character of the population again which must account for the small improvement in the fourth ward with its slight increase in density, and in the sixth, where there has actually been a decrease of ten per cent. In regard to the two wards where consumption has increased, the ninth and the twenty-first, whatever change there has been in the population would not account for it. It is probable that in both districts there has been less improvement in housing con-



*Decrease in consumption in the wards of Manhattan*

<i>Rank</i>	<i>According to decrease from consumption 1890</i>	<i>According to decrease in Consumption death rate 1890 - 1901</i>	<i>Rank</i>
1	Ward 2	Ward 2	1
2	" 4	" 13	2
3	" 1	" 11	3
4	" 6	" 7	4
5	" 5	" 3	5
6	" 14	" 14	6
7	" 8	" 8	7
8	" 3	" 12	8
9	" 15	" 10	9
10	" 20	" 15	10
11	" 18	" 17	11
12	" 9	" 1	12
13	" 16	" 4	13
14	" 21	" 22	14
15	" 7	" 16	15
16	" 17	" 20	16
17	" 11	" 18	17
18	" 10	" 6	18
19	" 22	" 19	19
20	" 12	" 5	20
21	" 13	" 9	21
22	" 19	" 21	22

DIAGRAM XXI

ditions than there has been in many other tenement sections. This would be a partial explanation, but a more thorough investigation is called for than has yet been made into the causes of a situation so out of harmony with the general tendency.

The point of chief interest in any comparison of rates of decrease is whether or not the improvement has corresponded to the need. This can be best seen in Diagram XXI., in which the wards are arranged according to the position they occupied in 1890 and according to the rate of improvement since then.

Leaving out of consideration the second and third wards, where the figures are too small to be significant, there are few

TABLE 24.—DEATH-RATES PER 10,000 POPULATION FROM CONSUMPTION IN THE REGISTRATION AREA, BY AGE-PERIOD AND SEX, IN 1890 AND IN 1900

AGE	MALES		FEMALES	
	1890	1900	1890	1900
15-44 years.....	32.5	26.5	31.6	24.0
45-64 " .....	38.5	29.1	25.5	17.3
65 years and over.....	41.0	29.4	33.2	23.0

exceptions to the general rule that the wards with the highest death-rates in 1890 show a low percentage of decrease, while, conversely, the wards with a conspicuous decrease are those which had a low rate in 1890. In other words, the improvement has been where it was least urgently needed, and the worst-infected spots are not changing their character with any rapidity. Any disposition to rest content with what has already been accomplished in New York City must be disturbed by the reflection that such conditions persist as are found in the fourth and sixth wards, and that in the ninth and twenty-first, each with a population of 60,000, consumption is increasing.

*Decrease in activity from consumption, 1970-1990  
in the registration area of the United States, by age- periods*

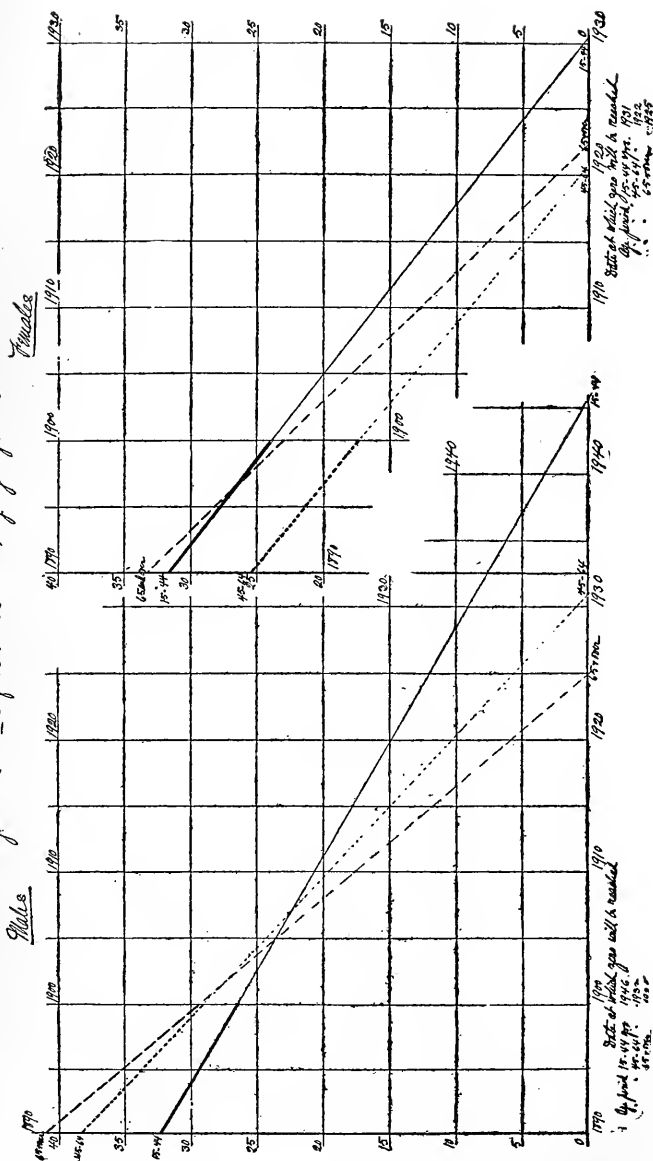


DIAGRAM XXII

The differences in the present sex and age incidence of consumption assume a new importance when their tendencies are examined. The rate of improvement during the last decade among men and women at three age-periods is shown in Table 24 and Diagram XXII.

At all three ages the women began with lower rates in 1890, and in 1900 were still in advance of the men. The advantage on the side of the women is probably due to three facts: that women are affected more quickly and more directly than men by any advance in general economic prosperity; that there has been more improvement in the housing conditions of the mass of the people than in the conditions under which they work; and that in the improvement that has been made in industrial conditions the chivalrous principle has obtained of protecting women first.

To indicate more clearly the differences in the rate of improvement all the lines showing the decrease between 1890 and 1900 have been continued in the diagram to the zero point. For obvious reasons this is not to be taken as in any sense a prophecy of what may be expected; it is not to be assumed, on the basis of this diagram, that by the year 1950 consumption will have disappeared entirely, as a cause of death. The mortality from consumption is due to a thousand different causes, varying in the degree of effort required to eradicate them. The less obstinate of these causes, as, for instance, dirty streets and windowless bedrooms, may be attacked directly. They have already been attacked in New York, and remedial measures are bringing prompt return. Other causes, such as a physical susceptibility to the disease in large numbers of persons, can be affected only by slow and circuitous processes, and it may well be that the total eradication of consumption is impossible. In this connection it is worth while to remember that, after all, "to travel hopefully is a better thing than to arrive, and the true success is to labor."

The virtue of the pseudo-prophetic lines is simply that they offer a vivid method of comparing the rates of improvement.

From them it appears that if the rate of decrease of the last decade could be continued there would be no deaths from consumption among either men or women over sixty-five years of age, after the year 1925. Among women between forty-five and sixty-five years of age this cause of death vanishes even sooner, in 1922, but among men of the same age it persists ten years longer. Among both men and women between the ages of fifteen and forty-five, the period where consumption is now the most important cause of death, the rate of progress is slowest. Among women at this age consumption is not eliminated until 1931, among men not until 1946. The point of all this is that it is at the age of greatest economic and social significance, where consumption is an overwhelmingly important cause of mortality, that the rate of improvement has been the slowest. It gives pause to undue complacency over results already accomplished by suggesting, as did the analysis by wards of the decrease in New York City, that much remains to be done.

This scrutiny of the general decrease in the death-rate from consumption has a double value. The analyses by wards in New York, and by age and sex, reveal the fact that there are localities and elements of the population which have had little share in the general improvement that has been going on. The coincidence by which these localities and elements are the very ones where the ravages of the disease are the worst emphasizes their claim to first consideration and to individual treatment in the efforts for further progress. At the same time, the superior degree of improvement in the cities establishes the value of the preventive work already instituted, thereby furnishing a stimulus for additional and specialized measures.

## VI

### SOCIAL CONSEQUENCES

Tuberculosis is a social disease not only in the sense that its prevalence and its persistence depend on social factors, but

also because it is itself a factor of primary influence in other social problems.

Its relation to degeneracy is a question that has been too little investigated. Evidence is not lacking that the children of consumptives are below the average of physical strength and that they often exhibit psychical peculiarities. There are statistics indicating that consumptives and their children are more liable than others to insanity and idiocy. It may be that the modifications of temperament wrought by the disease may tend to increase certain forms of immorality. The mental characteristics popularly recognized as accompanying consumption have frequently been used in fiction. Their dramatic value is unquestioned, but how far they affect the practical problems of crime and dependency due to mental derangement has not yet been clearly demonstrated. These are questions whose discussion must be entrusted to experts in medical and psychical science.

There is another way in which society is affected by consumption, quite within the comprehension of the lay mind. It means an enormous loss in the aggregate productive power of the social body, and has no insignificant place among the causes of poverty.

The Medical Officer of Health of an English town is authority for the statement that if phthisis had not existed as a cause of death every person born in England and Wales in 1901 would have had an average increase of two years and a half in his expectation of life, and that the working period, from fifteen years of age to sixty-five, would have been lengthened by nearly two years. The translating of human life into pecuniary value is a delicate undertaking, but it is the most striking way of expressing this economic loss. Dr. Hermann M. Biggs has estimated that the total annual loss to New York City from tubercular disease is at least \$23,000,000, and that the loss to the United States must be more than \$330,000,000.

There are no figures to indicate the amount of poverty that is due to consumption, but the experience of charitable socie-

ties in every city furnishes examples of families who become dependent from this cause. Sickness is found to be the cause of poverty in at least one case out of four. The long duration of consumption and its liability to fall on the chief wage-earner of the family tend to give it an importance as a cause of poverty out of all proportion to its importance as a cause of death. Those who, although self-supporting, have made no provision for the future, are easily pushed by the first attack of this disease over the border-line into the class of dependents, while the illness of the chief wage-earner soon eats up the little savings of the most provident family; and even when a subordinate member is the victim his long illness becomes too serious a drain on the family's earning capacity.

In the absence of statistics on this point illustrations of concrete cases may be taken from the records of the Charity Organization Society and the United Hebrew Charities of New York City.

A native American, a mechanic of forty-one, with a wife and three small children, fell ill nine months ago. Neither the man nor his wife has ever been strong, but he is honest and industrious, and had always supported his family. They applied for help while the disease was incipient, were helped for a few weeks until the man found work that was easy and suitable, and are again independent except for the milk and eggs supplied for the man.

Another family has been brought from comfort to a reluctant dependence by this scourge. The head is an English silver-chaser, incapacitated for his trade on account of age. His wife is a delicate woman with poor eyesight. One son has tubercular abscesses. A daughter died of consumption not long ago. Another son, when just convalescent from an attack of typhoid fever, nursed this girl through her last illness, and he is now a victim of consumption. This young man, a skilled electrician, was the main support of the family, and his illness makes it necessary that they should receive charity.

The daughter of a frail, deformed German widow was forced

by consumption several months ago to give up her work, their only source of income. Another German widow, blind for four years, is entirely dependent on her twenty-eight-year-old son, who has recently developed consumption. The mother of five children, all under thirteen, is caring for a consumptive husband and doing what she can to support the family by acting as janitress.

Last January a combination of misfortunes brought the family of an Irish widow and her five children under the care of the Charity Organization Society. The children range from thirteen to twenty-three years of age, and all of the older ones have received a good education. The misfortunes were these: the two grown boys were temporarily out of work, one by reason of an accident to his foot, the other through an ill-advised business venture; the mother's health did not allow of her working steadily. As the seventeen-year-old girl was a cripple, and the fifth child only thirteen years old, the main burden of the family had fallen on the oldest girl. She had met the demand by work in a department store and later in electrical works, but at the expense of her health. She developed consumption and the family became dependent on charity.

A picture too often paralleled in its squalid features is afforded by the case of a white woman married to a Chinese laundryman, both of whom have consumption. They are known to have lived, since 1894, in seven different houses in Chinatown, all undoubtedly infected. The woman was found a few months ago, with her five small children, in one of the two dark, damp rooms which are their home, covering cord by the light of a kerosene lamp to supplement her husband's scanty earnings. With their combined efforts they would be unable to maintain life on even this low plane without the assistance of friendly neighbors, the husband's "cousins," and the Chinese Mission.

Suggestive of much beside the point in hand and illustrative of many Hebrew characteristics, is this story of a Russian peddler who died a few months ago. He had just succeeded



in bringing over his wife and two children when the hard work and privations of his two years in this country resulted in a physical break-down leading into consumption. His brother and the brother's wife, with four children of their own, offered the hospitality of their two-room tenement to the whole family. There they all lived together, the two men, two women, and six children, through the months of the invalid's decline, asking help from no one, and brought to the notice of a charitable society, a week before his death, only by the report of a neighbor.

If nothing could be done it would be worse than useless to dwell on the ravages of this disease. But it is admitted now that consumption is both curable and preventable. As its prevalence is due largely to social conditions, and as it in turn aggravates social evils, so its prevention depends chiefly on social activity. Its complete eradication is only a matter of time if the public can be roused to a sense of its responsibility. Aside from the humanitarian considerations, it is palpably of interest to the more fortunate part of society to save itself from the consequences of a neutral attitude.

The social results of consumption show why society should be concerned to eliminate this disease, as the variations in incidence show where its efforts can most advantageously be placed.

## VII

### CONCLUSION

The practical application of the facts brought out by the study of figures is, in the last analysis, the only justification of such a study. The first use served by statistics in the conflict with consumption was to attract the public mind by merely showing the size of the enemy. The necessity for decisive action against so formidable a foe has been impressed on every one by the iteration and reiteration of statements in regard to

the death-rate from consumption. I think we may assume that this fundamental object has by now practically been accomplished.

The next use is, if we may carry on the military figure, to disclose the strategic points for attack. This can be done only by an analysis of the gross death-rate. Such an analysis shows that among men, from twenty to forty-five years of age, the situation is the most serious, both because the death-rate now is heavy and because it is decreasing more slowly than in other parts of the population. It shows, further, that the city is more in need of attention than the country, and that in every city certain districts and even certain houses are worse than others; it shows that the Chinese, negroes, Bohemians, and Irish suffer more, and are consequently a greater menace in this respect to the community than the Jews and the Italians; and that special efforts are called for in behalf of persons employed in certain occupations. By regarding these, and all other indications which can be derived from the available statistics, the campaign can be conducted economically,—attacks can be made where the minimum of effort will result in the maximum of success.

It is from the natural history of the *bacillus tuberculosis* that we get the clue for the specific weapons to be used in hunting it down and exterminating it. Its natural history teaches that it does not multiply after it has left the human body and that it may be killed by the simplest methods, exposure to direct sunshine being the surest, while, on the other hand, it may retain its virulence for two years or more if allowed to remain in a dark, damp corner. The weapons indicated are, therefore: the control of the habit of indiscriminate expectoration; the disinfection of apartments where consumptives have lived; the education of all members of society in the few simple facts which they should know about the cause and nature of consumption; and the multiplication of dispensaries, hospitals, and sanatoria, to care for persons in all stages of the disease who cannot otherwise receive proper treatment.

But since there will always be a residuum of the people who either through ignorance of or indifference to their responsibility in this matter cannot be controlled, the effective campaign must go much farther. It must concern itself with strengthening the defenses, as well as with directly attacking the enemy. And just here the "social history" of the *bacillus* again becomes valuable, for, in addition to showing the importance of the enemy and the strategic points for attack, it suggests supplementary means for carrying on the campaign. It points to the fact that everything that can be done to make men healthier and happier is germane to this purpose of preventing tuberculosis. The improvement of the housing of the working-classes and of the sanitary conditions of theatres and churches, as well as of factories and shops; the multiplication of parks and play-grounds, gymnasiums, and baths; the widening of streets; the enforcement of a standard of healthful conditions in all occupations; the reduction of the working-day; the raising of wages; the education of the women and girls of the tenements in the art of housekeeping and the science of food preparation; the crusade against the noxious features of the saloon; scientific instruction about the effects of alcohol in the public schools—all these and kindred efforts tend, less indirectly than might be thought, to reduce the death-rate from tuberculosis.

In fact, the trend of opinion among the best authorities seems to be in the direction of emphasizing more and more these apparently indirect methods of dealing with the problem.

The problem would soon disappear of itself if it were possible for everybody to breathe fairly pure air, to keep clean with a reasonable effort, and to have enough of the right sort of food to eat. Theoretically it would not seem extravagant to hope for such a situation, but practically it will require vigorous action along all the lines suggested, and more, to bring it about.

From this point of view a campaign plan so extended as to include attacks on all the problems now vexing society is less beside the mark than it may seem at first sight. Its very

comprehensiveness is its most valuable feature, since it serves to emphasize the necessity for concerted action, and suggests at the same time the encouraging reflection that every bit of social effort "works together for good," whether consciously or not, to decrease the suffering from tuberculosis.

The idea of the importance of co-ordinating all social forces is everywhere finding recognition. Nowhere, perhaps, has it been more definitely and more significantly expressed than at the meeting of the Central International Tuberculosis Committee in Paris last May, where it was the dominant note through all the proceedings. It was particularly well put by M. Casimir-Périer in these sentences from his opening address:

"The struggle with tuberculosis is intimately bound up with the solutions of the most complex economic problems, and no plans will be complete which have not for their basis the material and moral improvement of 'the people.' The struggle with tuberculosis demands the mobilization of all social forces, public and private, official and voluntary."

"The mobilization of social forces" is a phrase that merits adoption. Doubtless it will achieve popularity in connection with a subject where the military metaphor is so apposite that honest efforts to avoid it are apt to result only in fresh variants.

It is not surprising that the French, with their passion for embodying ideas in institutions, should be the first to apply this one. At the same meeting where another national characteristic found illustration in the felicitous phrase of the ex-president of the Republic, Professor Brouardel announced that in France the project had been conceived of forming a sanitary federation. This federation will include societies against tuberculosis and against alcoholism, societies for improving the housing conditions of the working classes, mutual benefit societies, the whole teaching force, and will, in short, "constitute a union where there will be room for all those who have at heart the public welfare, the health of the people, the physical and moral betterment of their fellow-men." Such a sanitary federation, if extended to its logical bounds, would include in

its ultimate membership every individual in the nation whose age and intelligence would allow him to understand the object.

It may be a far cry to the degree of enlightenment and sense of responsibility which would be required, but none the less all effort directed specifically against consumption must contemplate as its final object the erection of the nation into a Committee on the Prevention of Disease and Allied Evils.



APPENDIX 2

SCHEDULE FOR RECORDING THE SO-  
CIAL HISTORY OF CASES OF  
CONSUMPTION





## SCHEDULE IN REGARD TO CONSUMPTIVES

### *I. Personal Description.*

- a.* Sex.
- b.* Date of birth.
- c.* Color.
- d.* Nationality.
- e.* Birthplace of mother.
- f.* Length of residence.
  1. In the U. S.
  2. In New York City.
- g.* City-bred or country-bred?

### *II. Family Relations.*

- a.* Single, married, widowed, or divorced?
- b.* Did father have a strong constitution?  
Did mother?
- c.* Did father drink?
- d.* Did mother drink?
- e.* Members of family or household.

	SEX	DATE OF BIRTH	RELATIONSHIP TO PATIENT
I			
2			
3			
4			
5			
6			
7			
8			

*III. History of Illness.*

- a. How long has patient been ill?
- b. Health before consumption appeared.
  1. Was constitution strong or weak?
  2. Was digestion naturally good, indifferent, or poor?
  3. Was patient well nourished?
- c. Stage of the disease reached at present.
- d. Account of treatment received, with results.
  1. Patent medicines.
  2. Private physicians.
  3. Dispensaries.
  4. Hospitals and sanatoria.

*IV. Other Cases of Consumption among Associates.*

(As many details as possible of the history of each case.)

- a. Relatives.
- b. Inmates of the household.
- c. Intimate friends.
- d. Other tenants in the same house.

*V. Housing, when the Disease first Became Apparent.*

- a. Lodging-house, hotel, boarding-house, or "at home"?
- b. Home conditions.

Type of house {

1. Number of families in the house.
2. Number of families on each floor.
3. Front or rear tenement.

Description of tenement {

1. On which floor?
2. Number of rooms.
3. Ventilation and light.
4. General sanitary condition.

*VI. Recreation before Becoming Ill.*

- a. What did the patient do for recreation?
- b. Where did he spend his evenings?
- c. How did he spend Sunday?
- d. What places of amusement did he frequent? (Give addresses.)

# *VII. Occupations*

TIME	ADDRESS	PLACE OF EMPLOYMENT								Length of Time Employed		WORK DONE BY PATIENT			CASES OF CONSUMPTION AMONG FELLOW-WORKERS		
		ROOM IN WHICH PATIENT WORKED								Years	Months	Materials used	Description of work	Was work exhausting?	Number known	REMARKS	
		Situation in building	Size	Number of windows	Were windows kept open?	Any other ventilation?	General cleanliness	Were spittoons provided?	Were spittoons used?								
At the Time when Consumption Appeared																	
Before Becoming Ill with Consumption																	
After Becoming Ill with Consumption																	
																	1
																	2
																	3
4																	

*VIII. Record for Dependency.*

- a.* Has patient ever been an inmate of a charitable institution, public or private?

If so,

- 1.* When?
  - 2.* Where?
  - 3.* For how long?
- b.* Has patient ever applied for aid to a charitable society or individual?

*IX. Has Patient ever been an Inmate of a Correctional or Penal Institution?*

If so,

- a.* When?
- b.* Where?
- c.* For how long?
- d.* For what offence?

*X. Dissipation.*

- a.* Was patient an occasional, a moderate, or a "hard" drinker?
- b.* Had intemperance injured the constitution?
- c.* Other forms of dissipation.

*XI. Education.*

- a.* General: none, poor, fair, good, or excellent?
- b.* Did patient ever receive instruction in physiology and hygiene?

*XII. Other Information not Covered by Schedule Inquiries.*

(Signed)

APPENDIX 3

SOME SOCIAL ASPECTS OF THE  
TUBERCULOSIS INFIRMARY  
BLACKWELL'S ISLAND

By HOMER FOLKS  
COMMISSIONER OF PUBLIC CHARITIES OF THE  
CITY OF NEW YORK



## SOME SOCIAL ASPECTS OF THE TUBERCULOSIS INFIRMARY, BLACKWELL'S ISLAND

A FEW months after the establishment of the Tuberculosis Infirmary at Blackwell's Island, the Commissioner found himself in some uncertainty as to the value of the institution. The number of patients discharged, otherwise than as improved, was very considerable, and neither the nurses nor the physicians seemed to have a very clear idea as to why the population changed so rapidly, nor as to just how much was being accomplished for the patients while in the Infirmary. Principally for the purpose of securing a better insight into the actual workings of the institution from the patient's point of view, a Deputy Superintendent, Mr. Christopher Easton, was appointed in September, 1902, with instructions to give special attention to personal acquaintance with the patients, to the social life of the institution, to its economic and social features, and as to the real causes of so great a change in the population of the institution from month to month. The person appointed was taken from the eligible list for the position of Deputy Superintendent of Hospitals, and had not had previous experience in institutional or hospital work. He was a graduate of Princeton University, and brought to his work a well-trained mind and a marked taste for the study of social questions. He was instructed by the Commissioner to become personally acquainted with each patient immediately upon his admission to the institution, to secure from him such information as might, when collated with hundreds of other similar histories, throw light on the general question of the efficient

treatment of the tuberculosis problem by municipal and private action. He was instructed to explain to each patient the objects of the institution, how to adjust himself to the life of the institution, how to get the most benefit from it, and how to exercise the greatest precautions in his own behalf and in behalf of the other patients. He was to give each patient a copy of the rules of the institution and to explain their purpose. He was also to encourage the patients to report to him any matter about which they seemed to have reasonable cause for complaint, and was instructed to investigate carefully each such complaint, and to see that substantial justice was secured. He was also to interview each patient discharged from the Infirmary, either at his own request or because of insubordination or misconduct, or as apparently cured, and was to keep full records showing why each patient left the institution, and his condition on leaving as compared with his condition on admission. He was also to do as much as his other duties permitted in keeping in touch, by correspondence, with patients discharged from the institution as improved or apparently cured. The Deputy Superintendent was also given special oversight over the sanitary discipline of the Infirmary, the daily life of the patients, all questions of recreation, games, exercise (under the direction of the physicians), reading, entertainments, etc. A very complete report of Mr. Easton's work is included in the annual report of the Department of Public Charities for 1902, pages 128 to 173. This report includes copies of the rules of the institution and of the suggestions to patients leaving the Infirmary; it also includes a copy of the schedule of questions adopted upon the recommendation of the Charity Organization Society's Committee on the Prevention of Tuberculosis. The major part of the information contained in the following paragraphs is taken from Mr. Easton's report.

The schedule in regard to personal history, family relations, history of disease, etc., of each consumptive is quite elaborate. Considerable doubt was expressed as to whether the patients would be willing to give so much information, or as to whether, if given, it would be given grudgingly and with bad grace.



Mr. Easton finds, however, that, as a rule, the patients rather like to be questioned, and are not only willing, but glad, to give the desired information. About half his time is occupied by interviews with patients, either just after admission, or in regard to suggestions or complaints made by them, or when they express a desire to leave the Infirmary.

Comparatively little has been accomplished in the way of amusement and recreation, partly because of lack of place for the purpose, partly because there are not many games the patients care for, and partly because complete rest is for many patients the best possible treatment. The general tone of the place, however, is decidedly one of hopefulness and good cheer. It might reasonably be expected that this would be the least cheerful institution in the Charities Department. On the contrary, the impression which is gained, both by the casual visitor and by its permanent officials, is quite the opposite. This I attribute in part to the fact that many new methods are being introduced, and that they tend to interest the patients and encourage them to believe that their condition may be improved. It is also due in large part to the very valuable work done by Mr. Easton through his personal relations with the patients.

The statistics compiled at the time of the publication of the annual report cover too small a number of cases to have any considerable value. They are, however, extremely interesting, and suggest that similar statistics, covering a large number of personal records, would be of very great value, especially in indicating the social condition and factors which are prominent as causes of the disease. A preliminary schedule was adopted October 1, 1902, and used for the first 186 admitted after that date. The regular schedule of the Charity Organization Society's Committee was thereafter used. The statistics included in the report cover only 100 cases taken on the new schedule.

It is probable that the information entered upon the schedules is vastly more reliable than that ordinarily found upon the records of public institutions. The first statement made

by the patients was not entered upon the blank if there seemed to be any doubt of its truth, but by skilful questioning and cross-questioning every effort was made to arrive at the actual facts, and to enable the patient to understand why the actual facts were desired. It is Mr. Easton's opinion that not much information of importance has been withheld or mis-stated after such inquiry.

The following observations are based on the first one hundred cases for whom the Charity Organization Society schedule was used. The average duration of the disease before the patient's admission to the hospital was seven months, twenty-one days; the average period of unsteady employment, three years and four months. The latter figure is much larger than it otherwise would be by reason of the large number who had been unsteady workers owing to dissipation or some cause other than consumption. The seven months and twenty-one days' duration of the disease prior to admission to the Infirmary is, on the other hand, probably too short. Many patients have not realized their condition in the early stages of the disease. The corresponding period of the patients admitted to the State Sanatorium, Rutland, Massachusetts, is stated as twelve and one-quarter months, although they receive a more incipient class of cases than does the Infirmary. Almost exactly half of the patients are between the ages of thirty and forty-five. The numbers by each period are as follows:

Under 20.....	1
20 to 25.....	7
25 to 30.....	9
30 to 35.....	15
35 to 40.....	15
40 to 45.....	19
46 to 50.....	8
51 to 55.....	12
55 to 60.....	8
60 to 65.....	6
	<hr/> 100

Forty-one per cent are native-born and fifty-nine per cent foreign-born. The birthplace of the mothers of the patients shows only twelve per cent native- and eighty-eight per cent foreign-born. The figures in detail are as follows:

## NATIVITY

New York City.....	28	Switzerland.....	1
United States.....	13	Russia.....	4
Ireland.....	21	Africa (Liberia).....	1
Italy.....	4	Scotland.....	1
Canada.....	2	England.....	5
Japan.....	1	Holland.....	1
Sweden.....	3	Hungary.....	2
Austria.....	3	Poland.....	2
Germany.....	6	Wales.....	1
Bohemia.....	1		

## BIRTHPLACE OF MOTHER

New York City.....	4	England.....	8
United States.....	8	Scotland.....	1
Ireland.....	44	Russia.....	6
Italy.....	5	Germany.....	12
Canada.....	1	Austria.....	5
Japan.....	1	Bohemia.....	1
France.....	1	Sweden.....	3

The figures showing the occupations of the patients are of little value except as indicating the very wide distribution of such occupations. The figures are as follows:

## MAIN OCCUPATIONS

Waiters.....	7	Musician.....	1
Outside salesmen.....	2	Putting in furnaces and ranges....	1
Sailors.....	3	Umbrella maker and repairer.....	1
Postal clerk.....	1	Banknote printer.....	1
Agent.....	1	Wood polisher.....	1
Chance indoor and outdoor workers	13	Painters.....	2
Machinist.....	1	Carpenter.....	1
Butcher.....	1	Unskilled indoor and outdoor	
Cook.....	1	workers.....	2
Cigar-box maker.....	1	Varnisher.....	1
Longshoremen.....	3	Engineer.....	1
Plasterers.....	3	Coppersmith.....	1
Stone setter.....	1	Stableman.....	1
Unskilled outdoor workers.....	12	Fireman.....	1
Telegraph clerk.....	1	Tinsmith.....	1
Cigarmaker.....	1	Drivers.....	3
Clerk.....	1	Compositor.....	1
Collector.....	1	Car driver.....	1
Bridge builder.....	1	Stone cutters.....	2
Printers.....	2	Chance indoor workers.....	3
General hotel and restaurant work	1	Porter.....	1
Plumbers.....	3	Bricklayer.....	1
Ropemaker.....	1	Tailors.....	3
Bakers.....	2	Iceman.....	1
Gardeners.....	2	Translator.....	1
Steamfitter.....	1		

Professional, 2 per cent ; commercial, 9 per cent ; mechanics, 21 per cent ; trades, 22 per cent ; unskilled, 46 per cent.

Average length of time which patient has not worked at all before coming to this hospital, 2 months, 14 days.

Average period of unsteady employment before stopping work entirely, 3 years, 4 months.

Number of patients in the condition of whose employment nothing unhealthful was revealed .....	22
Number who have taken up a poorer grade of work than their main occupation at time consumption appeared or after becoming ill with consumption...	27
Number who have maintained the same grade of work after becoming ill with consumption, but followed it unsteadily.....	12
Number who were doing nothing at time consumption appeared.....	3
Number who did not work after becoming ill with consumption.....	26

Commenting on these figures, Mr. Easton says:

“The statistics have not made as great a showing for previous unhealthy conditions, physical, industrial, and social, as I had expected. I suppose I have been so much impressed with the stories of certain individuals that I have not given sufficient relative weight in my mind to those of many others which have been less tragically interesting. Then, too, it must be remembered that there is nothing more individual than suffering and failure, and that no collected statistics can give any adequate idea of the loss and wreck of life—in the larger sense of the word,—of the suffering, conscious and unconscious, of the consumptive poor. It does not seem to mean much when it is stated that twenty-seven per cent. took up a poorer grade of work on becoming ill, but it certainly means a great deal for a commercial traveller to get down to peddling cheap pictures in his old age; or a compositor to have to turn lamp-lighter; or a gardener to have to make beds in a lodging-house as a last resort; or a skilled mechanic to have to take up unloading trucks, or some other rough work, and have his former associates ‘cut’ him on account of his industrial decline, as one of them told me was the case.”

The tabulation of the inquiries in regard to what the patients did for recreation, where they spent their evenings, and where they spent their Sundays, was as follows:

	General Recreation	Evenings	Sunday
Home.....	..	45	41
Reading home.....	18	13	11
Reading-rooms.....	14	6	2
Baseball.....	2	..	1
Theatre.....	23	7	2
Walking.....	20	16	17
Club-room.....	7	3	3
Visiting.....	7	5	7
Saloon.....	41	41	19
Excursions.....	12	1	9
(Four of them to Coney Island.)			
Church.....	5	1	5
Smoking.....	3	2	2
Park.....	2	1	2
Mission.....	2	1	2
Fishing.....	1	..	1
Music.....	1	1	1
On docks.....	1	1	1
Cards.....	3	1	..
On streets.....	7	7	2
Pool-room.....	5	2	5
Billiards.....	1	1	..
Y. M. C. A.....	1	1	..
Lectures.....	1	..	..
Disorderly houses.....	1	1	..
Dancing.....	2	2	<sup>1</sup> 15
No time.....	6	8	<sup>2</sup> 4

<sup>1</sup> Working.    <sup>2</sup> Sleeping.

Mr. Easton's comments on this table are :

"The information as to recreation, or lack of recreation, was taken almost verbatim from the patients. For example, undoubtedly more than forty-five spent some of their evenings home, but only forty-five gave home in answer to the question where they spent their evenings. Home, of course, means where they slept. It might mean a kitchen, or a fore-castle, or a stable, or a lodging-house. It will be noticed that the nine chief forms of recreation, arranged in order of their popularity, begin with the saloon and end with the church. The small number giving theatre in the evening, although it is third in popularity, is explained by the fact that most of them give it under the question on amusement. Walking, reading and visiting are relatively more popular in the evening and on Sunday than in general. This is explained by the fact that they are usually given more than once by the same person,

while rank in popularity depends on the number of different persons giving a certain amusement. The saloon is the most popular, both by persons patronizing it and as a way of spending the evening and Sunday. The percentage for work on Sunday is the same as that given by the Massachusetts Bureau of Labor Statistics for that State."

The habits of the 100 patients in regard to drink were as follows:

Abstainers .....	2
Occasional drinkers .....	11
Moderate drinkers.....	43
Hard drinkers.....	44
	<u>100</u>

Among interesting personal items noted on the history schedules are the following:

No. 66.—Cloak designer in Germany. Two and one-half years in United States. Ill two years. Found methods of trade different in this country and had to take anything he could get. First waiter in good places, then extra waiter. Finally voice got so weak he could n't even get extra waiter's job. Well educated.

No. 65.—Restaurant work in damp, dirty basement in Bleecker Street. Thirty in room where he slept, two of them consumptives. Cots in two tiers. Food had no nourishment—weak soup and bread. The floor was not scrubbed the four months he was there. Place run by religious charitable association. Patient says they had men working in filthy, damp subcellar.

No. 42.—Has alternated iceman and kitchenman for several years, former involving getting overclothes wet, and latter all kinds of bad conditions.

No. 43.—Worked in bakeries two and one-half years after becoming consumptive. Worked with a careless consumptive in one bakery for three years.

No. 186.—Three girls went out with consumption from laundry where he worked. One man told me that seven men had left with consumption the machine shop where he worked the year before becoming ill.

No. 105.—Railroad porter. Infection from consumptive travellers in sleeping-cars, going to health resorts. Same man illustrates exposure. Would stand on rear platform of car to cool off when perspiring.

No. 27.—Covering furniture from house to house for seven months. Felt very weak. Would do a quarter of a day's work and then rest for remainder of day. No treatment during this time.

No. 48.—Worked steadily at heavy work for two months after becoming ill.





APPENDIX 4

A LIST OF LECTURES DELIVERED UNDER THE AUSPICES OF THE COMMITTEE ON THE PREVENTION OF TUBERCULOSIS DURING THE WINTER OF 1902-3



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October 7th.—Jacob Riis House, Henry St. Mothers' Meeting. Dr. Maria Vinton. Attendance, 60.

November 7th.—Nurses' Settlement, Henry St. Dr. S. A. Knopf. Attendance, 18.

November 10th.—Assembly Hall, United Charities Building. Dr. J. H. Huddleston. Attendance, 275.

December 3d.—West Side Branch Y. M. C. A., 318 West 57th St. Social Conditions. Dr. S. A. Knopf. Attendance, 160.

December 4th.—Young Men's Hebrew Association, 92d St. and Lexington Ave. Dr. M. Fishberg. Attendance, 120.

December 8th.—Assembly Hall, United Charities Building. Tuberculosis—Its Causation and Prevention. Dr. H. M. Biggs. Attendance, 110.

December 10th.—West Side Branch Y. M. C. A. Predisposing Causes. Dr. E. Le Fevre. Attendance, 101.

December 15th.—Faith Presbyterian Church, 359 West 48th St. Dr. E. L. Dow. Attendance, 60.

December 17th.—West Side Branch Y. M. C. A. Relation of Food and Drink to Tuberculosis. Dr. R. G. Freeman. Attendance, 127.

December 18th.—Young People's Association House of Fifth Ave. Presbyterian Church, East 63d St. Dr. W. N. Berkeley. Attendance, 60.

December 21st.—Young Men's Hebrew Association. Dr. S. A. Knopf. Attendance, 250.

December 28th.—University Settlement, West Side Branch, 38 King St. Lecture in Italian. Dr. A. Stella. Attendance, 125.

December 29th.—West Side Y. M. C. A. Dr. H. M. Biggs. Attendance, 89.

January 6th.—Women's Guild. Church of Holy Communion, Sixth Ave. and 20th St. Dr. Sarah R. Creighton. Attendance, 70.

January 7th.—Colored Mission, 135 West 30th St. Dr. E. L. Dow. Attendance, 175.

January 8th.—Mothers' Meeting, 17th St. M. E. Church. Dr. Mary Willets. Attendance, 60.

January 9th.—23d St. Y. M. C. A. Dr. Harlow Brooks. Attendance, 150.

January 9th.—Friendly Aid House, East 34th St. Dr. Angenette Parry.

January 9th.—Colored Y. M. C. A., West 53d St. Social Phases. C. H. Johnson. Attendance, 20.

January 9th.—Madison Square Church House, Third Ave. and 30th St. Dr. J. B. Huber. Attendance, 130.

January 10th.—Educational Alliance, East Broadway. Lecture in Yiddish. Dr. M. Fishberg. Attendance, 450.

January 10th.—University Settlement, Rivington and Eldridge Sts. Lecture in Yiddish at East Side Janitors' Society. Dr. Max Girsdansky. Attendance, 120.

January 10th.—Young People's Association House, East 63d St. Men's Meeting. Dr. W. N. Berkeley. Attendance, 35.

January 13th.—Girls' Club, 17th St. M. E. Church. Dr. A. S. Daniell. Attendance, 8.

January 16th.—Colored Y. M. C. A. Dr. E. L. Dow. Attendance, 30.

January 16th.—Union Settlement, East 104th St. Dr. W. N. Berkeley. Attendance, 40.

January 16th.—Institute Hall, 218 East 106th St. Dr. W. C. Phillips. (Board of Education Lecture.)

January 20th.—New York Trade School, First Ave. and 67th St. Dr. J. B. Huber. Attendance, 67.

January 20th.—Public School 61, 169th St. and Third Ave. Dr. A. W. Baird. Attendance, 83.

January 20th.—College Settlement, Rivington St. Mothers' Meeting. Dr. Angenette Parry. Attendance, 42.

January 23d.—Colored Y. M. C. A., West 53d St. Dr. Kilmer. Attendance, 45.

January 23d.—Italian Mothers' Meeting, Five Points Mission. Dr. Augusta Vedin. Attendance, 56.

January 26th.—Faith Presbyterian Church, West 48th St. Dr. R. G. Freeman. Attendance, 96.

January 27th.—Institute Hall, Jay St., Brooklyn. Dr. F. S. Kennedy. (Board of Education Lecture.) Attendance, 318.

January 29th.—German Baptist Church, East 118th St. German Lecture. Dr. N. Stadtmuller. Attendance, 200.

January 29th.—Pro-Cathedral, Stanton St. Dr. H. P. Loomis. Attendance, 95.

January 29th.—Boys' Club, Amsterdam Ave. and 110th St. C. H. Johnson. Attendance, 63.

January 29th.—Moravian Church (West Indian negroes), 224 West 63d St. Dr. J. B. Huber. Attendance, 20.

January 29th.—Madison Square Church House, Third Ave. and 30th St. Mothers' Meeting. Dr. A. Parry. Attendance, 28.

January 30th.—Colored Y. M. C. A., West 53d St. Dr. A. W. Baird. Attendance, 48.

February 5th.—King's Daughters' House, East 128th St. Mothers' Meeting. Dr. Jane Robbins. Attendance, 50.

February 6th.—Friendly Aid House, East 34th St., Mothers' Meeting. Dr. A. Parry. Attendance, 25.

February 7th.—University Settlement, Eldridge St. Janitors' Society. Yiddish Lecture. Dr. Fanny Dembo. Attendance, 98.

February 8th.—Greenwich House, 26 Jones St. Italian Lecture. Dr. A. Stella. Attendance, 24.

February 9th.—Assembly Hall, United Charities Building.  
Dr. S. A. Knopf. Attendance, 48.

February 10th.—Public School 47 (Borough of Queens).  
Dr. F. S. Kennedy. (Board of Education Lecture.) Attendance, 96.

February 10th.—17th St. M. E. Church. Girls' Club. Dr. Reed. Attendance, 14.

February 11th.—East Side High School, East 76th St. Dr. J. B. Huber. (Board of Education Lecture.) Attendance, 114.

February 11th.—Public School 131, Brooklyn. Dr. W. C. Phillips. (Board of Education Lecture.)

February 12th.—Public School 82, 70th St. and First Ave. Dr. W. C. Phillips. (Board of Education Lecture.)

February 12th.—Public School 14 (Borough of Queens).  
Dr. F. S. Kennedy. (Board of Education Lecture.)

February 13th.—Church of the Holy Communion, Sixth Ave. and 20th St. Dr. W. C. Phillips. (Board of Education Lecture.)

February 14th.—French Y. M. C. A., West 24th St. French Lecture. Dr. S. A. Knopf. Attendance, 95.

February 19th.—Young Men's Club, 47 Greenwich Ave. Dr. A. W. Baird. Attendance, 40.

February 22d.—Zion Educational League, Rivington St. Yiddish Lecture. Dr. L. W. Zwisohn. Attendance, 100.

February 24th.—People's Union, East 14th St. Dr. J. B. Huber. Attendance, 145.

February 25th.—Teachers College, Columbia University. Dr. S. A. Knopf. Attendance, 100.

February 26th.—7th St. M. E. Church. Dr. H. G. Watson.

February 27th.—West Side Neighborhood House, West 50th St. Dr. A. W. Baird. (Board of Education Lecture.) Attendance, 170.

February 27th.—Second Ave. Branch Y. M. C. A. Dr. S. A. Knopf. Attendance, 68.

February 27th.—Deaconess Training School, 1186 Madison Ave. C. H. Johnson. Attendance, 36.

March 1st.—Italian Church, East 112th St. Italian Lecture. Dr. A. Stella. Attendance, 300.

March 2d.—Deaconess Training School. Dr. R. G. Freeman. Attendance, 36.

March 6th.—Nurses' Settlement, Henry St. Miss Brandt. Attendance, 18.

March 7th.—Deaconess Training School. Dr. Sarah R. Creighton. Attendance, 40.

March 9th.—St. Augustine's Church, East Houston St. Dr. J. B. Huber. Attendance, 75.

March 10th.—Public School 32. Dr. J. B. Huber. (Board of Education Lecture.) Attendance, 170.

March 10th.—Visitation Hall (Borough of Brooklyn). Dr. F. S. Kennedy. Attendance, 248.

March 11th.—Public School 16 (Borough of Richmond). Dr. W. C. Phillips.

March 11th.—Public School 84, West 50th St. Dr. A. W. Baird. (Board of Education Lecture.) Attendance, 111.

March 16th.—Assembly Hall, United Charities Building. Dr. A. Jacobi. Attendance, 127.

March 19th.—Public School 170, West 63d St. Dr. W. C. Phillips. (Board of Education Lecture.)

March 19th.—Deaconess Training School. Dr. J. B. Huber. Attendance, 40.

March 20th.—Parents' Meeting. Public School 80, West 41st St. Dr. E. L. Dow. Attendance, 270.

March 22d.—Young People's Association House, East 63d St. C. H. Johnson. Attendance, 24.

March 23d.—Public School 11 (Borough of Queens). Dr. F. S. Kennedy. Attendance, 129.

March 25th.—Cercle Coligny. French Church, East 26th St. French Lecture. Dr. C. S. Valadier. Attendance, 85.

March 26th.—House of Refuge, Randall's Island. Dr. J. B. Huber. Attendance, 700.

March 26th.—King's Daughters' Circle (Colored). Moravian Church, West 63d St. Dr. A. S. Daniell. Attendance, 18.

March 27th.—Public School 72 (Borough of Queens). Dr. A. W. Baird. (Board of Education Lecture.)

March 29th.—Janitors' Society Club Rooms, Attorney St. Yiddish Lecture. Dr. Paul Kaplen. Attendance, 46.

March 29th.—Public School No. 7. Yiddish Lecture. Dr. M. Girsdansky. Attendance, 239.

April 3d.—Children's Aid Society House, 224 East 63d St. Dr. A. W. Baird.

April 6th.—Public School 166. Dr. W. C. Phillips. (Board of Education Lecture.)

April 9th.—St. Michael's Parish House, 99th St. and Amsterdam Ave. Dr. A. W. Baird. Attendance, 108.

April 9th.—Public School 116 (Borough of Brooklyn). Dr. F. S. Kennedy. Attendance, 325.

April 9th.—Public School 5 (Borough of Brooklyn). Dr. W. C. Phillips. (Board of Education Lecture.)

April 11th.—Public School 1, Catherine and Henry Sts. Dr. A. W. Baird. (Board of Education Lecture.)

April 13th.—Assembly Hall, United Charities Building. Dr. H. P. Loomis.

April 24th.—Public School 55 (Borough of Brooklyn). Dr. F. S. Kennedy. Attendance, 253.

May 28th.—West Side Settlement House (Y. M. C. A.), 460 West 44th St. Dr. Addison W. Baird.



APPENDIX 5

THE GERMS OF CONSUMPTION

BY J. H. HUDDLESTON, M.D.



## THE GERMS OF CONSUMPTION

*What are the Germs?*—Ever since 1882 the word “germ” used in this title has meant a very definite thing,—a vegetable, not a bug or anything else belonging to the animal world,—but a vegetable of a low order,—and so small that a single one can be seen only with a powerful microscope. The German physician, Dr. Robert Koch, discovered it and proved that it was the one essential cause of the disease, which in all its forms is known as tuberculosis, and which in some of its forms is popularly known as consumption.

The germ is shaped like a slender, straight, or slightly curved rod, and is so short that it would take three thousand of them in line to equal one inch in length. It has other names; it is sometimes called a microbe, sometimes a bacterium, and again a bacillus. It is alive—that is, it grows and multiplies, but it cannot move itself. So light is it, however, that it may be carried in the saliva expelled in talking, or in the sputum raised in coughing, and when that saliva or sputum is dried to dust it may be blown about in the dust. It may live many months, especially in a dark damp place, but it is usually killed by ordinary daylight within one week, and by direct sunlight it is killed within a few hours. Cold has no effect on it, but it is immediately killed by being boiled, and is even destroyed by a temperature of 140° F. continued for fifteen minutes. Many substances too, known as disinfectants, kill these germs in a shorter or longer time—minutes or hours. Rarely, if ever, does the germ multiply outside of the body except under laboratory conditions—that is, when it is planted

on a special soil, and cared for at a special temperature, as may be done in a laboratory.

*Where are they Found?*—They are found in every person or animal affected with tuberculosis, in the parts of the body so affected. Almost every tissue may be the seat of growth of this parasite, but most frequently by far the lungs are affected, though in children what are called the lymph glands and the bones are especially attacked. Millions of germs may exist in a single organ. They are also found, and in this is the danger, wherever the sputum from a lung so diseased has fallen, or wherever that dried sputum has been blown. They are also often found in the milk from a diseased cow, or in the flesh from a diseased animal,—or in the laboratory on the special soil on which they are grown. In the laboratory so many may be growing together in a glass that they can be seen as a grayish-white mass.

*What do they Do?*—If some are floating in the air as they are apt to do wherever dust in an infected place is stirred up, and one, two, or more pass into the nose or mouth with the air breathed in, and if they obtain lodgment in some tissue, and finding the necessary food and temperature there begin to grow just as a fungus does on another plant,—what happens? In the first place, just as dust getting into the eye irritates it and makes it water—that is, makes the eye react,—so these germs irritate the tissue and set up a reaction there, and on the character of this reaction depends the fate of the person or animal so infected. In every case, some of the cells of the body gather round the germs, and form a little mass or lump there, which is called a tubercle, and these tubercles vary in size from the minutest pin-point to the size of a marble or larger, and if many fuse together they may attain almost any size capable of being contained in the organ. Now around these tubercles there may take place a process ending in healing, or one ending in destruction and death. Just as a wound heals with the formation of a dense, hard scar, so scar material may be formed around and through the tubercles, shutting them in, and this scar may even be turned into stone. When

there is a firm enough scar formed, the germs can do no injury, and the person is said to be cured. Again the irritation may be so great that the tissue becomes inflamed for some distance around the germs; if, for example, the germs are in the lung, a part of the lung may become solid just as it does in pneumonia. While the germs are multiplying they form a poison which is itself an irritant, and which, being absorbed, causes the fever and certain other of the symptoms of tuberculosis. When these tubercles and tubercular masses attain some size they usually die at their centres, and if there is an opportunity, as when there is an air tube leading from them to the open air, this dead matter may be coughed up, forming part of the sputum of consumptives.

No dust causes consumption unless it contains this particular germ, but wherever a consumptive has not been careful of his sputum, and has allowed it to mingle with the dust, that dust has become infectious. There are many sorts of germs in all ordinary dust besides the germs of consumption, and some of these other germs, when breathed in, may grow in this same dead tubercular matter, make it break down faster, and help in blood poisoning. It is therefore one of the benefits of pure air that the person breathing it does not have to fight these other germs. When this dead matter is coughed out, a hole is left behind, and the cavities in the lungs which many consumptives have are thus begun. This dead matter regularly contains the germs of consumption, sometimes in very large numbers. The actual number in a measured amount has been counted in some cases under a microscope, and by this count, with a knowledge of the amount of sputum the consumptive has raised, it has been proved that as many as four thousand million germs have been expectorated in twenty-four hours.

While the tubercles are increasing in size, some of the germs may get into a blood-vessel, and be carried off with the blood and deposited in another organ. One or more organs at a distance may thus be infected, and if the number of germs so scattered is large there may be tubercles found all over the body—a rapidly fatal condition.

*How do they Enter the Body?*—It is possible for the germs of tuberculosis to get into the body in several distinct ways; first they may be swallowed in food as in tuberculous milk or meat or in the milk taken by an infant from the unclean nipple of a consumptive mother.

Unless the greatest cleanliness is habitual, the hands of a consumptive are often contaminated with saliva or sputum, and infect food, books, papers, and other things; when these infected articles are handled by others, some of the germs on them may be carried to the mouth and swallowed. The moustache and beard of a consumptive can be kept clear of germs only by constant care, and if they are not clean they may infect napkins and handkerchiefs. Kissing a consumptive may also permit the germs to be transferred to another. When the germs are taken into the mouth they may be swallowed and pass through the entire digestive tract and be evacuated without doing harm, or, on the other hand, they may come to rest and cause infection at any point in the tract—though oftenest in the tonsils and in the intestines.

In the second place, and more rarely, germs enter through cuts in the skin when one is handling tuberculous material, like the handkerchief or sputum jar of a consumptive; and third, most rarely of all, they may be given to the unborn child by the mother.

Practically, however, these germs in the majority of cases enter in the fourth way, as infected dust breathed in by the person. In this case they may infect first the larynx, or voice box, or the large or small air tubes, or the lungs themselves. In every city, and New York is no exception, there is a large number of careless consumptives, who allow their undisinfected sputum to mingle with the dust wherever they are. These people are dangerous; careful consumptives are not dangerous, but the careless ones infect their surroundings indoors and on the streets.

*What Protects against Inhaled Dust?*—Inasmuch as Dr. Prudden has shown that a person living in New York City breathes into his lungs in the course of a minute a number of

bacteria, varying from ten to four hundred according to the place where he is, it is worth while to consider what protection he has against these. Some of them, it should be said, are harmless; others might cause disease, and in the number there may be some of the germs of consumption.

There are, roughly speaking, four lines of defense. In the first place, a great many bacteria are caught in the nose or throat by the mucus, and are blown out or spat out or swallowed. These, therefore, do not enter the lungs. In the next place, the material, which starts down into the lungs along the windpipe and smaller air-tubes, and comes to rest on the walls of the tubes, is swept out by the very minute projecting hairs called cilia, which line the walls, and constantly move in such a manner that whatever is on them is driven away from the lungs up to the outer air.

There is a third protection in the existence in the body of certain cells which travel about and gather up waste material and carry it off to deposit it in a safe place or to digest and destroy it. Some of these cells imprison the germs and carry them away in the same way. Finally, if some of the germs do get into the smallest air spaces of the lungs and pass through their walls, they are taken up by a nutrient fluid called the lymph, which circulates all through the body, and carried to the fourth defense—certain glands which are placed at the roots of the lungs as well as at other points in the body, and which act as filters. By these the germs are caught out of the stream and prevented from going to the rest of the body.





APPENDIX 6.

TUBERCULOSIS—ITS CAUSATION  
AND PREVENTION

By HERMANN M. BIGGS, M.D.

MEDICAL OFFICER AND DIRECTOR OF THE BACTERIOLOGICAL LABORATORIES,  
DEPARTMENT OF HEALTH, NEW YORK CITY  
PROFESSOR OF CLINICAL MEDICINE, UNIVERSITY AND BELLEVUE  
MEDICAL COLLEGE



## TUBERCULOSIS—ITS CAUSATION AND PREVENTION

NO subject more vitally concerns the welfare of a community than that pertaining to its healthfulness. How its members live, and how and at what age they die, how much sickness occurs among them and what is its nature, are questions of vital importance, both to the community as a whole and to each individual in it. These are essential features of the problem, whose gradual solution will teach men more and more how to live properly, and how they may secure longer, healthier, and therefore happier lives.

The healthfulness of any community or locality is to be judged by the statistics of sickness and death, considered in relation to the causes of such sickness and death (it is not only the number of deaths or the number of cases of sickness in proportion to the population, but also the nature of the diseases which cause this). In rural districts the degree of healthfulness depends largely on the natural conditions, such as elevation, climate, soil, and to a less extent upon artificial conditions. In densely populated cities, on the contrary, the natural conditions become relatively unimportant factors in determining the degree of healthfulness, so much do they become subordinated to the artificial conditions resulting from the lives and labor of the inhabitants. It may be said, within certain limitations, that the inhabitants of every city have it largely within their power to determine what the death-rate of their city shall be. The presence of much sickness and of a high death-rate in any urban population are largely due to the

existence of unsanitary conditions in the occupations, habitations, food, and water supply of the inhabitants—all factors which lie to a great extent within their control. Hence when any city has a high death-rate—for example, when thirty or thirty-five persons out of every thousand of the population die each year, as was formerly the case in Liverpool and New York, instead of fifteen or twenty, as is the case in many of the larger cities to-day—it is because unsanitary conditions are permitted to exist. These exist to a very small extent from necessity, but chiefly because of ignorance, neglect, and indifference on the part of the people, or incompetence on the part of the authorities.

The average length of life in any country or city is spoken of as the “expectation of life at birth.” This average life-term in some cities—for instance in Liverpool and Manchester, which have been distinguished for their high death-rates—is often but little more than one-half that of the healthiest country district. The average lifetime of each person born in Liverpool, until recently, was twenty-six years; in London it was thirty-seven years; while in Surrey, a healthy district, it was forty-six years.

These considerations show how vast is the significance to every individual of the degree of healthfulness of the community, for upon it depends not only his or her relative freedom from illness, but also his or her probable lifetime.

In the casual consideration of the healthfulness of communities as compared with the conditions existing in earlier centuries, we are inclined to think without investigation that there has been but little advance in modern times, and that while some diseases have been greatly restricted, or entirely stamped out, these have been replaced by others equally as fatal to the human race. More careful study, however, shows how erroneous are these views. In the seventeenth and eighteenth centuries, the average annual death-rate per 1000 of the population throughout the civilized world was at least 50, and probably much more. From 1620 to 1643, the absolute annual mortality for London was over 70 per 1000 of the population,

and the average duration of life of each person born, less than 15 years. One hundred and fifty years later, for the decennial period ending in 1780, the expectation of life (or the average lifetime) in London had increased only 4 years, and was 19 years; while from 1831 to 1835, including an epidemic year, the death-rate had fallen to 32 per 1000, and the mean expectation of life had increased from 19 years to nearly 30 years. At the present time the mean life-term for all England is considerably more than 40 years, or more than double that of 1780. From 1770 to 1780, in London, not less than 5 in 1000 died annually of small-pox; the death-rate from this disease is now an insignificant fraction. In the sixteenth century, fever, plague, cholera, and dysentery—diseases which are now practically extinct in civilized communities—destroyed annually nearly 31 out of every 1000 of the inhabitants of London, or nearly twice the total deaths now from all causes. Even previous to 1875, 518 out of every 1000 children born in Liverpool died during the first ten years of life, while in the healthy districts of England only 205 died during this period. Formerly in New York City more than 600 out of every 1000 children died during the first ten years of life; this mortality has now been reduced one-half.

I have referred to these general facts in regard to the significance of death-rates, and to certain features in the sanitary history of the past, simply to emphasize the importance to the individual of the sanitary conditions of the locality in which he lives, and to bring out more clearly the enormous advances that have taken place in the last fifty years in general sanitary conditions. A large number of those diseases which in the past frequently decimated the population have been either restricted within narrow limits or completely stamped out. Plague, typhus fever, Asiatic cholera, leprosy, and small-pox are among the diseases which either have been completely stamped out in civilized communities, or occur only spasmodically or in small epidemics; their influence in the production of sickness and death has fallen to insignificant proportions. The prevalence of typhoid fever in most well-regulated com-

munities has very greatly decreased. Through the introduction of diphtheria anti-toxin, the mortality from diphtheria has been reduced to one-half, one-third, or to even one-fourth in some localities, of what it formerly was. Through the remarkable observations made in Cuba by Ross of the United States Army, and his associates, the prevalence of yellow fever is likely to be restricted in the future within narrow limits, as has been previously the case with each of the other great epidemic diseases.

I might mention several other infectious diseases whose prevalence has been restricted within very much narrower lines through the developments in modern preventive medicine, and among these is tuberculosis; and still there is no problem which confronts the sanitary authorities of the large municipalities at the present time equal in its importance and magnitude, than that presented by the tuberculous diseases, nor is there any other sanitary proposal which offers the promise of such vast returns in a diminishing rate of sickness and death, as one which provides successful measures for the prevention of this disease. This, although not a new problem, is of supreme importance. The tuberculous diseases are not more prevalent than formerly; on the contrary, there has been a steady and material decline in the death-rate caused by them in most of the large cities of the world; but only in recent years have the sanitary authorities and the medical profession begun to have some realization of the great possibilities in the restriction of this disease.

A comprehension of the full significance of the discoveries of Robert Koch, made twenty years ago, on the prevention of tuberculosis has only slowly found its way into the minds of the medical profession, and even now a large proportion of the profession and of the laity have failed to grasp its vast influence on the present and future happiness and prosperity of the human race. Koch showed in 1882 that tuberculosis was an infectious and communicable disease, produced by a germ, the tubercle bacillus. It followed as a necessary result from his discoveries, that it was an absolutely preventable disease.

So slowly, however, did the significance of these discoveries penetrate the minds of the profession and the people that already twenty years have passed and we have only just now begun to organize inadequate measures for the prevention of this disease.

Statistics, showing the great prevalence of the tubercular diseases, have been quoted so frequently as to have almost lost their force, and still the people, the legislators, the sanitary authorities, and even the medical profession, have remained indifferent to the vast expenditure unnecessarily made by the human race to this evil. Only limited, ineffectual efforts are made in its suppression, and we still view with comparative indifference the ravages of a disease which causes from one-quarter to one-third of all the suffering and death at the best period of life—between the ages of fifteen and fifty-five—and this, too, when the evidence at command should be, it seems to me, conclusive to every reasonable mind that this loss could be largely prevented at a comparatively small cost in sacrifice, labor, and money. I make this statement with a full realization of its meaning, and after a familiarity with the sanitary problems involved gained by an active participation in their study in a great city for a period of nearly fifteen years.

It may be useful to discuss, in as simple a manner as possible, certain questions which are suggested in regard to tuberculosis. First: What is tuberculosis? The disease known as tuberculosis, and when affecting the lungs, as pulmonary tuberculosis or consumption, is an infectious and communicable disease. It is very common in human beings and in certain of the domestic animals, especially cattle. About one-fourth of all deaths occurring in human beings during adult life in all civilized countries is caused by it, and nearly one-half of the entire adult population at some time in life acquire it. It has been proved beyond any possibility of doubt that a living germ called the tubercle bacillus is the cause, and the only cause, of tuberculosis. It does not seem necessary to state the facts upon which this assertion is based, for the discovery first made by Robert Koch in 1882 has been confirmed

so often and so completely that it now constitutes one of the most absolutely demonstrated facts in medicine. Tuberculosis may affect any organ of the body, but most frequently first involves the lungs, and is then commonly known as consumption. When it affects the skin it is known as lupus; the lymph glands are frequently diseased and especially those in the neck, and this type was formerly known as scrofula. The commoner forms of chronic disease of the knee joint, hip joint, and spine are generally the result of tubercular infection of the joints and bones. The disease may also affect the throat, the intestinal canal, the coverings of the brain, or any of the other organs and tissues of the body. It is always the same disease when found in any one of these parts, and always produced by the same germ—the tubercle bacillus. When these germs find their way into the body they multiply there, if favorable conditions for their growth exist, and produce small new growths or nodules which are called tubercles, and from these the disease tuberculosis derives its name. As the result of the action of the germs contained in the tubercles they tend to soften, and the discharges from these softened tubercles containing the living germs—tubercle bacilli—are thrown off from the body. In pulmonary tuberculosis, or consumption, these germs are contained in the expectoration, often in almost incredible numbers. It has been estimated that in some cases two or three thousand million tubercle bacilli are discharged in the expectoration from a single case of consumption in the course of twenty-four hours. The germs thus thrown off do not grow under ordinary conditions outside the living human or animal body, although they may frequently retain their vitality and virulence for long periods of time, even when thoroughly dried. As tuberculosis only results from the action of these germs, it follows, from what has just been said, that when the disease is acquired it must result from receiving into the body the living germs which have come from some other living being affected with the disease. It should be especially noted in this connection that tuberculosis differs widely in this respect from some other infectious and communicable diseases,



like typhoid fever, in which the germs multiply outside the living body after having been thrown off in the discharges of some persons suffering from the disease. The tubercle bacilli do not find the conditions necessary for their multiplication, except in living beings, human or animal, and therefore, when tuberculosis occurs, it must be as the result of infection directly by the same identical tubercle bacilli, which have been thrown off from some human being, or possibly from some animal, suffering from the disease.

Tuberculosis is commonly produced in the lungs, which are the organs most frequently affected first, by breathing air in which living germs are suspended, as dust. The material which is discharged, sometimes in large quantities, by persons suffering from consumption, as has been said, contains the germs often in enormous numbers. This material, when expectorated, frequently lodges in places where it afterward dries, as on the street, floors, carpets, clothing, handkerchiefs. After drying, it is very apt in one way or another to become pulverized and then floats in the air as dust. It should be especially noted that it is chiefly a source of danger after drying, and not when in a moist condition. It has been shown experimentally that dust collected from the most varied points—in hospital wards, dispensaries, asylums, prisons, rooms in private houses, and even street cars, where consumptive patients are present or have been present—is capable of producing tuberculosis in animals when used for their inoculation. Such dust may retain for weeks its power of producing the disease. On the other hand, dust collected from rooms in institutions or houses which have not been occupied by tubercular patients does not produce the disease when used for the inoculation of animals. These observations show conclusively that where there are cases of pulmonary tuberculosis, under ordinary conditions, the dust surrounding them is likely to contain the tubercle bacilli, and persons inhaling the air in which this dust is suspended may be taking in the living germs. It should, however, be distinctly understood that the breath of tuberculous patients and the moist sputum received in proper

cups are not elements of danger, but only the dried and pulverized sputum. The breath and moist sputum are free from danger because the germs are not dislodged from moist surfaces by currents of air. Handkerchiefs and clothing which have been soiled by sputum are particularly dangerous because on these the sputum dries, scales off, and then becomes pulverized. If all discharges of tuberculous persons were destroyed at the time of exit from the body, practically the only danger of communication of this disease from man to man would be removed. It follows then as an absolutely necessary sequence of what has been said that tuberculosis is not only a distinctly preventable disease, but is much more readily and certainly preventable than most of those diseases usually called contagious, for the sole source of infection is contained in the discharges, which may be readily destroyed at the time of exit from the body.

It may, perhaps, be well here to define a little more fully what is meant by an infectious and communicable disease, such as tuberculosis is, and how it differs from one which is contagious. Any disease which is produced by the entrance and multiplication in the body of some minute form of animal or vegetable life of simplest structure is called an infectious disease. The contagious diseases, examples of which are small-pox, scarlet fever, measles, etc., form one class of the infectious diseases. They have several distinguishing characteristics:

(1) In none of these contagious diseases have we any knowledge as to the exact nature of the specific organism causing them. This is a rather remarkable fact and seems to indicate that they are caused by some kind of life which our present methods of investigation will not reveal.

(2) These diseases may be transmitted to well persons through simple proximity to the sick for a short period of time; small-pox, for example, may be contracted by passing in the street a person suffering with the disease. A person sick with one of the contagious diseases may so infect the atmosphere of the room in which he is present that any susceptible person entering it may contract the disease.

(3) In the contagious diseases, there are no adequate precautions known which will render a person suffering from one of these diseases free of danger to those coming in immediate contact with him.

The class of infectious diseases to which tuberculosis belongs, I have called communicable and non-contagious. In this class belong typhoid fever, diphtheria, Asiatic cholera, pneumonia, tuberculosis, etc. In each of these diseases, the cause is well-known, and its life history has been thoroughly studied. We know how the germs enter the body, what they do in the body, how they are thrown out of the body, and how they act outside of the body. They are always contained in some discharges from the body: viz., in typhoid fever, in the discharges from the bowels and kidneys; in cholera, in the discharges from the intestines or stomach; in tuberculosis, in discharges from the diseased tissues wherever they may be. If these discharges are destroyed at the time of their exit from the body, all danger of communication of the disease to others is removed. The room occupied by a person ill from one of these diseases and the atmosphere of it are not, under proper conditions, in any way a source of danger. The most intimate contact with a tuberculous patient may, under proper conditions, be quite free of danger. It has been frequently said that a properly conducted sanatorium for consumptives is the safest place one can find, so far as the liability of contracting this disease is concerned.

I have always felt that much harm has been done by calling tuberculosis a contagious disease. It causes confusion in the lay mind, because the popular conception of a contagious disease is connected with such diseases as scarlet fever and small-pox, in which a very limited contact may result in infection. Every person should understand that tuberculosis is quite different in nature from these diseases, and the mental confusion caused by calling it contagious, often results in producing incredulity, or a totally unwarranted fear of contact with tuberculous persons. Too much emphasis cannot be placed on the fact that consumptives are only a source of

danger through the discharges from the diseased tissue—chiefly the sputum—and if these are destroyed the most intimate contact with tuberculous patients is free of danger.

It is a well-known fact that some persons, especially the members of certain families, are particularly liable to tuberculosis, and that this liability may be transmitted from the parents to the children; so marked is this liability and so frequent is the development of the disease in families in different generations that the affection was long considered hereditary. We now know that tuberculosis can only be caused by the entrance of the tubercle bacilli into the body and their growth in the body, and this inherited liability simply renders the individual a more easy prey to the germs when once they have gained entrance. The varying susceptibility to tuberculosis found in different families and in different individuals is perfectly analogous to that existing with relation to other diseases, only that in the case of tuberculosis the susceptibility is more general under the natural conditions of exposure to infection than is the case with almost any other disease. It has been argued that if tuberculosis is so widely disseminated as is claimed, and so many tubercle bacilli are discharged by affected individuals, every individual, especially in large cities, must from time to time be exposed to infection, and that consequently, if these facts were true as claimed, all persons would sooner or later contract the disease. In reply to this, it may be said that the observations of those with the largest experience in performing autopsies show that nearly one-half of all adults living in large cities do at some time contract the disease, and it has been said that in the Vienna General Hospital, which is the largest general hospital in the world, in fully eighty-five per cent. of dead bodies some tubercular changes are found, and in nearly forty-five per cent. of all the deaths occurring in this hospital tuberculosis is the cause. The reason that a still larger percentage of the human race do not contract the disease or die of it is because they have sufficient resistance to overcome and destroy the tubercle bacilli which they take in. As it is, on the average about one-third of the deaths between the ages of fifteen and

forty-five are caused by this disease, and probably in one-quarter more of the deaths occurring in persons over fifteen years of age some tubercular changes will be found in the body. This resistance to tubercular infection, which is shown by many persons, is not peculiar to tuberculosis, but exists with relation to all of the infectious diseases. If a number of persons drink typhoid bacilli in water, only a small percentage of them will contract typhoid fever, the others escaping. Similar conditions exist with regard to the other infectious diseases. The frequent occurrence of several cases of pulmonary tuberculosis in a family is, then, to be explained, not on the supposition that the disease itself has been inherited, as this is of excessively rare occurrence, but that it has been produced after birth by direct transmission from some affected individual. Most of these recurring cases in successive generations in the same family result from direct transmission or house infection. The houses which have been occupied by consumptives become infected, and thus the disease is transmitted to other members of the family. Where the parents are affected with tuberculosis the children from the earliest moments of life are exposed to the disease under the most favorable conditions for its transmission, for not only is the dust of the house likely to contain the bacilli, but the relationship between parents and children, especially between mother and child, are of that close and intimate nature most favorable for the transmission by direct contact. In relation to this I may quote from Dr. Knopf's essay on tuberculosis:

"The most common modes of infection during early childhood are perhaps the following: The consumptive mother caresses the child and kisses it on the mouth; she prepares the food, tasting it to judge its temperature and flavor, through the same rubber nipple or with the same spoon the child uses, and thus unconsciously conveys the germs of her disease from her own mouth to that of the child. Later on the child will play on the floor of the room, and should there be a consumptive in the family, who from carelessness or ignorance is not careful in the disposal of his expectoration, the child is indeed

likely to be infected. The little one, while playing on the floor, may with great facility inhale the bacilli floating with the dust in the air and can thus acquire tuberculosis by inhalation, the full development of which may only take place in later years, when the origin will not be thought of. Again, the little child touches everything it can take hold of, infecting its fingers thoroughly, and by putting them in its mouth tuberculosis by ingestion may result and gradually develop into consumption of the bowels. Lastly, should the child's nails be neglected it may scratch itself with the infected fingers, and thus inoculate its system with the disease. Tuberculosis of the skin, or lupus, may result from such an unfortunate accident.

"To prevent these infections during childhood is certainly possible by taking the following precautions: Not only should consumptives be religiously careful with their expectoration, but they should associate as little as possible with young children, and stay away from playrooms and playgrounds. We repeat that to kiss children on the mouth should never be allowed and the little ones should be taught never to kiss nor be kissed by strangers. They should be kissed by their own friends and relatives as little as possible and then only on the cheeks. The floor on which the child plays should be kept scrupulously clean. Carpets in such a place are an abomination; they only serve as dust and dirt collectors, and not infrequently harbor the germs of contagious diseases. The hands and nails of little children should be kept as clean as possible.

"Expectorating on playgrounds should be considered a grave offence and should be punished accordingly. These playgrounds should be kept clean, as free from dust as possible, and daily strewn with clean sand or gravel."

Aside from infection through the inhalation of dust which contains tubercle bacilli, we may sometimes have the disease produced by the ingestion of food containing these germs. It is well known that many domestic animals, and especially cows, are particularly susceptible to tuberculosis, and that the meat and milk of such an infected animal may contain tubercle bacilli. This mode of infection was formerly regarded as a

very important one, but the feeling has been growing stronger and stronger among scientific men that this is a less serious source of danger than was formerly believed. Considerable doubt has been thrown upon its occurrence by the observations of Koch.

These observations seem to show that tuberculosis is not readily transmitted from cattle to human beings, although this has not been definitely proven. The explanation of this fact, if true, is that the tubercle bacilli which cause the disease in cattle have been somewhat modified in character by long residence in the bovine species, and as a result have lost a portion of their disease-producing power in the human being. This, no doubt, can be readily acquired again under special conditions. We have in other forms of disease illustrations of this same thing. Small-pox and cow-pox, or vaccinia, the disease from which vaccine virus is obtained, are undoubtedly both the result of the same kind of an infection. Still it is difficult to produce cow-pox by the direct inoculation of the bovine species with small-pox virus, but if monkeys are first inoculated with small-pox virus and then the cows inoculated from monkeys, cow-pox results, the virus being modified sufficiently in its passage through monkeys to render the cow then susceptible. While, therefore, holding in abeyance a final decision in regard to the danger to human beings from the prevalence of tuberculosis in cattle, it seems quite certain that the seriousness of the danger of infection from this source has been somewhat overestimated. From what has been said, it follows: (1) That tuberculosis is a distinctly preventable disease; (2) that it is not directly inherited; and (3) that it is acquired by direct transmission of the tubercle bacillus from the sick to the well, usually by means of the dried and pulverized sputum floating as dust in the air.

It may be worth while now to estimate briefly the annual cost to the community of tuberculosis.

During the last twenty years there has been a reduction in the death-rate from tubercular diseases in New York City of nearly forty per cent. The total number of deaths in 1901

ascribed to this disease in New York City was 9412. For the Boroughs of Manhattan and the Bronx alone, concerning which we have more accurate data for a series of years, we find that during the past twenty years there has been an actual decrease in the total number of deaths, notwithstanding an increase of population; that is, in 1881 the deaths from the tuberculous diseases in the Boroughs of Manhattan and the Bronx numbered 6123; in 1901, twenty years later, they numbered 6051. During this time the population of these Boroughs had increased nearly 70 per cent., viz., from a little over 1,200,000 to more than 2,100,000. Taking now the deaths for the whole of New York City, annually, at 10,000,—as we may safely assume that several hundred deaths each year which should be ascribed to the tubercular diseases are ascribed to some other cause,—we may estimate the economic loss to the municipality. It may be conservatively estimated that each human life at the average age at which the tubercular deaths occur is worth to the municipality \$1500. The cost of each life at this age is usually more than this. This gives a total value to the lives lost annually of \$15,000,000.

We may further assume that for an average period of at least nine months these persons are unable to work and must be cared for. The loss of their service during this period may be estimated at \$1 a day, and the cost of food, nursing, medicines, attendance, etc., at \$1.50 more per day, making a further loss of \$2.50 per day, for each person dying, for a period of 270 days. This gives us a further loss to the municipality of \$8,000,000, making a total annual loss to the city from tubercular diseases of at least \$23,000,000. It has been estimated that in the United States annually not less than 150,000 deaths are caused by the tubercular diseases, and estimating the value of these on the basis just given, we have an annual loss to the country of more than \$330,000,000.

This method of estimating the importance of the work in the prevention of tuberculosis may seem unfeeling, but it is an economic view and one which should appeal to the various state and city officials. I have not the slightest doubt, per-



sonally, after a very large experience in the sanitary supervision of infectious diseases in New York City covering many years, that the expenditure of a small part, annually, of this sum would result in a very rapid decrease in the prevalence of the tuberculous diseases in this country.

A system of registration of all tuberculous cases has been in force in New York for many years. Last year there were reported to the Department of Health more than 13,000 new cases. It may be safely estimated that this represents less than one-half of the cases actually existent in New York City, for many cases live for several years after they are brought to the attention of the Department and are only included when originally reported, and many are not reported at all. For example, nearly 5000 other cases were reported in 1901, which had been previously reported. I think we may safely estimate that 30,000 cases of tuberculosis in a stage of the disease in which it could be easily recognized by a competent physician are present in New York City.

I have had a census of the cases actually under treatment in the hospitals in New York City made annually for a series of years, and the total number never much exceeded 1000, or less than four per cent. of the cases actually present in the city. The vast proportion of the remainder are in tenement houses. I have estimated that the total expenditure in the city of New York in its public institutions for the care and treatment of tuberculous patients is not over \$500,000 a year, or not more than two per cent. of the actual loss to the city annually. If this annual expenditure were doubled or trebled it would mean a saving of several thousand lives annually, to say nothing of the enormous saving in suffering.

It is now fifteen years since the New York City Health Department first began, in a very small way, its efforts for the prevention of tuberculosis, and these have been rewarded by a reduction in the mortality all out of proportion to the expenditure in money and time which has been made. Still, more has been done in New York than in almost any city in the world. The measures, however, now in force are quite

inadequate, as compared with the importance and magnitude of the problem. The sanitary authorities, however enthusiastic and efficient, and the medical profession, however influential and numerous, cannot grapple with this problem unless they have the hearty support of the people and the administration of the city. They must have generous appropriations for carrying on the work—for the provision of medical inspectors and disinfectors, for educational measures, for the establishment of dispensaries and sanatoria for the care of incipient cases, and of homes to which advanced cases may be removed, and where they may be made comfortable until the inevitable fatal termination comes. We must remember, in this connection, that every incipient case and every advanced case of tuberculosis which is removed from its home and surroundings and placed in a properly equipped and conducted institution is, in this way, not only given a fair chance for recovery of health, but is educated as to the means to be taken to prevent further extension of infection, and, at the same time, one focus of infection is removed from the city. On the average, every case of tuberculosis infects at least one other case, and if removed to a hospital early enough, the infection of this second case would be, in each instance, prevented, and thus the total number of cases would be reduced.

It is in an educational way that lay organizations for the prevention of tuberculosis may be of the greatest service. They serve to arouse interest in and to disseminate knowledge of the nature of tuberculosis; they form compact bodies of public-spirited citizens, whose influence is of the greatest value in so moulding public sentiment that funds shall be forthcoming to erect and maintain dispensaries, sanatoria, and homes for the consumptive poor. Through their assistance and that of the public press, we may hope eventually to obtain state and municipal appropriations for the suitable care of the consumptive poor. New York State has made a small beginning in this way, and it is hoped that the State sanatorium, now in course of erection in the Adirondacks, may lead to very much larger appropriations for this purpose. The state is spending

many millions of dollars annually for the care of the insane, and while this is absolutely necessary for humanitarian reasons, I have no hesitation in saying that far greater returns would be obtained from the expenditure of one-quarter the amount in the prevention and cure of tubercular disease.

I believe that tuberculosis may be practically stamped out. The reduction in the mortality from it in New York City since 1886 has been about forty per cent., which means if applied to the Greater City a decrease of more than 6000 in the number of deaths annually caused by it. The vast significance of this is still more enhanced when we remember that to a very large extent these deaths take place in the working period between fifteen and fifty-five years of age. I have no doubt that the measures first begun in a very small way in New York City fifteen years ago, inadequate as they have been, have resulted in saving the lives of at least twenty thousand persons. The annual deaths in the Greater City still number between nine and ten thousand, and we know that these are to a very large extent unnecessary.



APPENDIX 7

THE DUTIES OF THE INDIVIDUAL AND  
THE GOVERNMENT IN THE COM-  
BAT OF TUBERCULOSIS

BY S. A. KNOPF, M.D., NEW YORK

Hon. Vice-President, British Congress on Tuberculosis ; Attending Physician to  
the Riverside Sanatorium for Consumptives of the City of New York ;  
Consulting Physician to Gabriels Sanatorium for Consump-  
tives, Gabriels, N. Y.; etc.



## THE DUTIES OF THE INDIVIDUAL AND THE GOVERNMENT IN THE COMBAT OF TUBERCULOSIS

By way of preface, I desire to state that I shall speak not only of the duty of the government but particularly of the duties of individuals, represented by the consumptives themselves, those living with them, the general public, the teachers, the clergy, the gentlemen of the press, and the philanthropists. I might be asked why I do not say anything of the duties of the physician. Let me assure you that the medical profession is fully aware of its great duties and responsibilities in this struggle against tuberculosis. Many of you have doubtless heard of the numerous interesting discussions in the various medical assemblies. The duties of the physician in this matter are, of course, of a specific character, and his curative and preventive measures in dealing with the tuberculosis problem have been amply discussed before medical audiences.

Whenever there is an enemy to fight we must know his strong and his weak points, and the more intimately we are acquainted with his strength and his weakness, the more likely we are to become victorious over him. Let us therefore consider for a moment the character and the peculiarities of the disease we are desirous to combat.

### DEFINITION OF PULMONARY TUBERCULOSIS

Pulmonary tuberculosis, or consumption, is a chronic, infectious, and communicable disease, caused by the presence of

the tubercle bacillus, or germ of consumption, in the lungs. The disease is locally characterized by countless tubercles—that is to say, small rounded bodies, visible to the naked eye. The bacilli can be found by the million in the affected organ. It is this little parasite, fungus, or mushroom, belonging to the lowest scale of vegetable life, which must be considered as the specific cause of all tuberculous diseases. This parasite not only gradually destroys the lung substance through ulcerative processes, but at the same time gives off certain poisonous substances, called toxins, which give rise to various, and often serious, symptoms.

The important symptoms of pulmonary tuberculosis are cough, expectoration (spitting phlegm), fever (increased temperature of the body, especially in the evening hours), difficulty in breathing, pains in the chest, night-sweats, loss of appetite, hemorrhages (spitting of blood), and emaciation (loss of flesh). In the matter expectorated it is often possible to find the tubercle bacillus with the aid of the microscope and certain coloring matters. It appears in the form of small, slender rods.

How may this germ of consumption enter the human system?

#### METHODS OF ENTRANCE OF THE GERM INTO THE HUMAN SYSTEM

There are really three methods whereby this germ may enter: namely, by inhalation—that is, being breathed into the lungs; by ingestion—that is, being eaten with tuberculous food; and by inoculation—that is, the penetration of tuberculous substance through a wound in the skin.

#### INHALATION

Let us treat first the most frequent method of the propagation of tuberculosis, namely, that arising from the indiscriminate deposit of the tuberculous sputum. A consumptive individual, even at a period when he is not confined to his bed, may ex-



pectorate enormous quantities of bacilli. Now, if his expectoration, or spittle, is carelessly deposited here and there so that it has an opportunity to dry and become pulverized, the least draught or motion of the air may cause it to mingle with the dust, and the individual inhaling this dust-laden atmosphere is certainly exposed to the danger of becoming tuberculous if the system offers a favorable soil for the growth of the bacilli. By "favorable soil for the growth of bacilli" must be understood any condition in which the body is temporarily or permanently enfeebled. Such a condition may be inherited from parents, or acquired through alcoholism, or drunkenness, or other intemperate habits, through privation, or disease.

#### DROP INFECTION

Besides the danger arising from carelessly deposited sputum, or spittle, the inhalation or ingestion of the small particles of saliva which may be expelled by the consumptive during his so-called dry cough, when speaking quickly or loudly, or when sneezing, must also be considered as dangerous for those who come in close contact with the invalid. These almost invisible drops of saliva may contain tubercle bacilli. Recent experiments in this direction have shown the possibility of infection by this means.

The next most frequent method of the propagation of tuberculosis is through the ingestion of the bacilli—that is to say, when the germ of consumption is taken with the food.

The third and much less frequent way of the cause of tuberculosis is the inoculation, or penetration of the tuberculous substance through the skin.

What should we do to stop the first and most frequent source of the dissemination of the bacillus?

A patient suffering from pulmonary consumption should know that no matter in what stage of the disease he may be, his expectoration, or spittle, may spread the germ of the disease if the matter expectorated is not destroyed before it has a chance to dry and become pulverized. The patient should,

therefore, always spit in some receptacle intended for that purpose. It is best to have this vessel made of metal so as not to break. It should be half filled with water or some disinfecting fluid, the main thing being to make it impossible for the expectoration to dry.

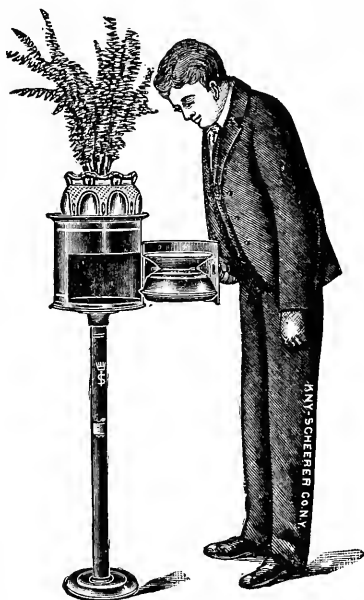


Fig. 1—Elevated Spittoon, Entirely of Metal—When in Use.



Fig. 2—The Same, Closed.

In factories, stores, railroad cars, waiting-rooms, court-rooms, restaurants, saloons, meeting-places, theatres, menageries,—in short, wherever many people congregate,—there should be a sufficient number of cuspidors well kept and regularly cleaned. They should be made of unbreakable material and have wide openings. If such measures are carried out, there will be no excuse for any one to expectorate on the floor and thus endanger the lives of his fellow-men.

A handkerchief should never be used as a receptacle for sputum. Patients who are too sick to make use of light porce-

lain or aluminum cups, should have a number of moist rags within easy reach. Care should be taken that the rags always remain moist, and that the used ones are burned before they have a chance to dry. The paper spit-cups with their contents should, of course, also be destroyed by fire.

For the use in public institutions, in corridors, and grounds, I would recommend an elevated spittoon (Figs. 1 and 2), which has numerous advantages over the ordinary spittoon placed on the floor. The latter is unsightly, may be tipped over, and usually presents on its rim or on the outside dried sputum which did not reach the receptacle proper. Having no cover, these old-fashioned cuspidors allow animals and insects to get at the contents and thus help in the dissemination of the bacilli.

The stand of the elevated spittoon is three and one-half feet in height, and consists of iron tubing with a bottom plate, which can be screwed on to the floor or fastened to a sunken board when used out-of-doors. The large cast-iron base, however, is in itself sufficiently heavy to prevent the spittoon from tipping over. On top of this tube is a round box of sheet iron, with a door which can be tightly closed. Attached to this door is a ring in which rests a blue or white enamelled iron spittoon. Thus, when the box is opened the spittoon is drawn forward and ready for use. The top of the stand is provided with a rim to facilitate the placing of a flower-pot or other ornament. These elevated spittoons, only visible

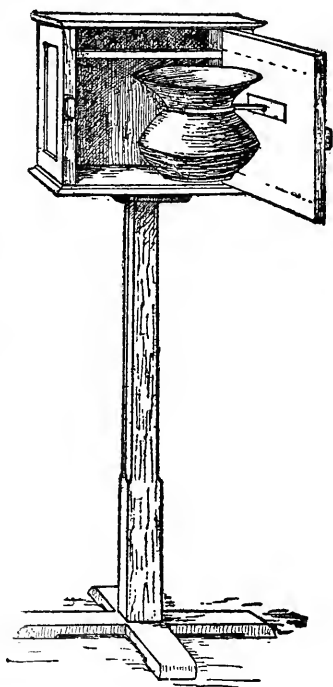


Fig. 3—Elevated Spittoon, Stand of Wood, Open.

when in use, by their convenient height and easy manipulation, make the deposit of the sputum into the cuspidor more certain than in the case where spittoons are placed on the floor.

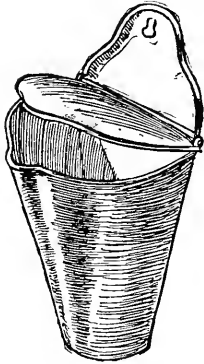


Fig. 4—Proedohl's Enamelled Iron Spittoon, to be Suspended at Convenient Height.

A similar elevated spittoon stand can be made of wood, which would make it considerably cheaper. (See Fig. 3.)

Proedohl's enamelled iron spittoon (Fig. 4) and its modifications (Figs. 4a, 4b, and 4c) can be suspended at any height, and are particularly suitable for use in workshops, factories, and schools.

For street use, particularly in health resorts, I have devised the following receptacle which might deserve the name "public self-cleansing spittoon" (Fig. 5). It is thirty-nine inches in height, supported by heavy tubing; the receptacle is made of heavy copper coated with pure tin on the inside, to the upper edge of which is screwed a perforated lead pipe which supplies the water for constant flushing. The receptacle is nine inches

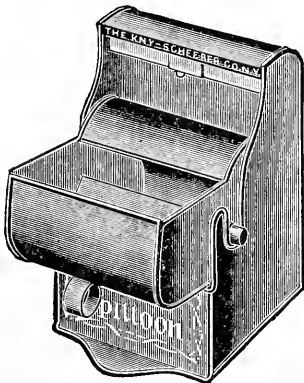


Fig. 4a—Wall Cuspidor of Metal, Open.

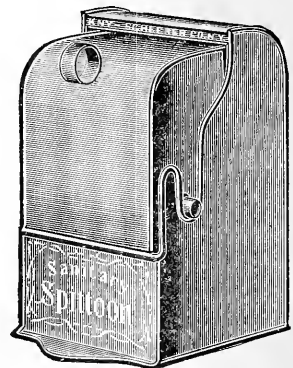


Fig. 4b—Wall Cuspidor of Metal, Closed.

in diameter, five inches deep, with a funnel-shaped bottom three inches deep, fitting into a two-inch iron cylinder support,

which also serves as a connection sewer, and this support is attached to a heavy cast-iron base. The lead-pipe water supply passes along the inside of the apparatus and can be attached to any hydrant.



Fig. 4c—Wall Cuspidor of Metal in Use.

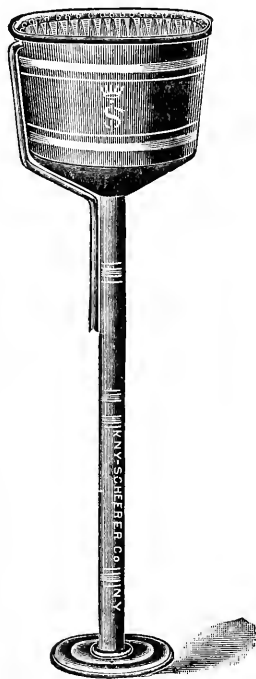


Fig. 5—Elevated Self-Cleaning Street Spittoon.

When outdoors, the patient should use a pocket flask of metal, strong glass, or pasteboard. There are numerous kinds of these in the market.

I show you here a little model which, perhaps, answers all the requirements (Figs. 6, 7, and 8). As you see it is oval in shape and can be conveniently placed in a pocket. It is about three and three-quarters inches in height, its longest diameter is two and three-quarters inches, and its shortest diameter one and one-half inches. The opening is round and has a diameter

of one and one-half inches. A movable funnel prevents the contents from soiling the cover, acting on the principle of the reversible inkstand. The flask is made of spring brass and is electro - nickel - plated. Two seamless brass cups are welded together, forming the flask, to which the cover is firmly soldered and the funnel spun (seamless) with a flange fits exactly on

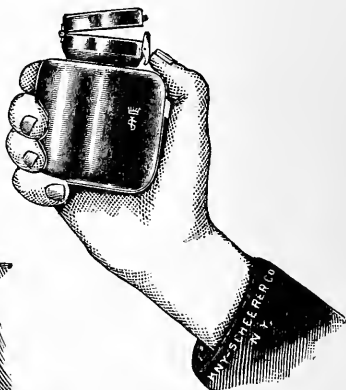


Fig. 6 — Nickel - plated, Oval - shaped Pocket Flask. Manageable with One Hand.



Fig. 8—Method of Emptying the Flask.

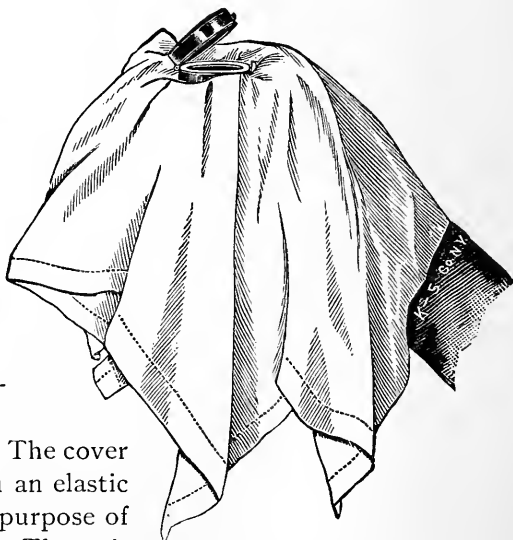


Fig. 7—The Same, Hidden in the Folds of a Handkerchief.

the rim of the cup. The cover is closely fitted with an elastic rubber ring for the purpose of preventing leakage. There is a strong spring catch which serves for opening and closing, and the flask can be manipulated with one hand by pressing

with the thumb against the opening spring and closing the cover with the index finger. By the aid of a wire hook the funnel can easily be removed and the flask emptied. By placing the flask in the centre of a moderate-sized handkerchief, taking up the four corners, and putting an elastic band around the neck of the flask outside of the handkerchief the cuspidor can be used without attracting any attention.

I also show you here a few other less expensive pocket metal flasks (Figs. 9 and 10) and paper spit-cups and purses (Figs. 11 and 12) which may answer the purpose just as well. Some of these, such as the Dettweiler flask (Fig. 13) and its modification, the one illustrated in Fig. 14, are made of blue glass.

For use at the bedside such sputum cups as are illustrated in Figs. 15, 16, and 17, made of pasteboard, or such as is shown in Fig. 18, made of light metal, are most convenient.

There will always be some consumptives who cannot be persuaded to use the pocket flask, for the simple reason that they do not wish to draw attention to their malady. The only thing for these people to do is to use squares of soft muslin, cheese-cloth, cheap handkerchiefs, or Japanese paper handkerchiefs specially manufactured for that purpose, which can be burned after use. They should also place in their pockets a removable lining of rubber or other impermeable substance which can be thoroughly cleaned. This additional pocket could be fastened to the inside of the ordinary pocket by clamps, and would thus be of no inconvenience to the patient. A pouch of vulcanized rubber or an oriental tobacco-pouch may be used in place of the extra pocket of impermeable material.

The danger of dissemination of the bacilli through the so-called dry cough (drop infection) is relatively small; we should, however, insist that the patient hold a handkerchief before his mouth or nose when he coughs or sneezes. The consumptive should be advised to carry two handkerchiefs with him, one to hold before his mouth and to wipe it with after having expectorated; the other to use only to wipe his nose. By being careful with the use of his handkerchiefs, the danger of infecting his nose and bronchial tubes will be materially lessened.



Fig. 9—Round-shaped, Nickel-plated Pocket Flask. Manageable with One Hand.

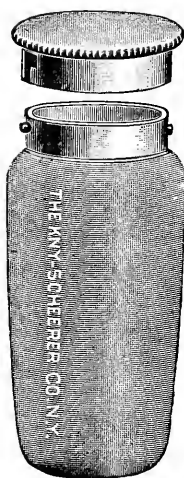


Fig. 10—Cheap Metal Flask, with Bayonet Closure.

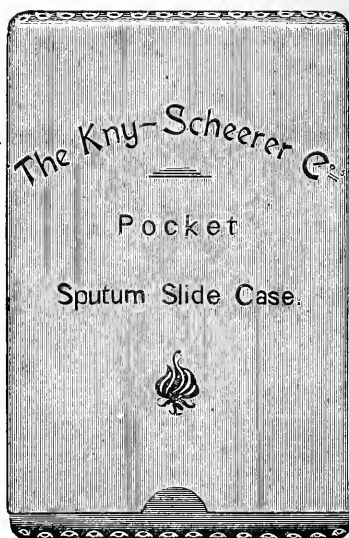


Fig. 11—Pasteboard Sputum Case, Resembling Cigar Case.



Fig. 12—Pasteboard Purse.

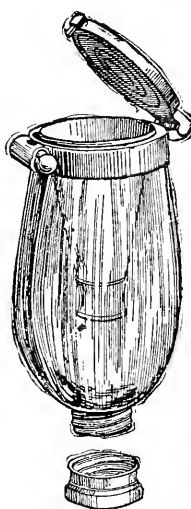


Fig. 13—Dettweiler's Pocket Flask.

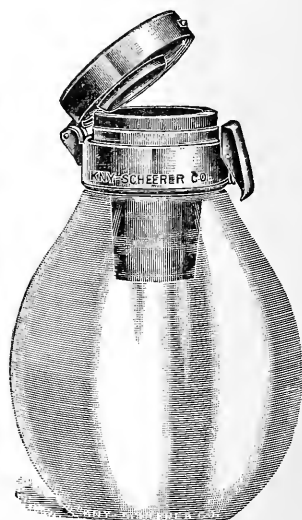


Fig. 14—Blue Glass Sputum Flask. Manageable with One Hand.



All soiled linens (sheets, pillow-cases, underwear, napkins, handkerchiefs, etc.) used by the consumptives should not be

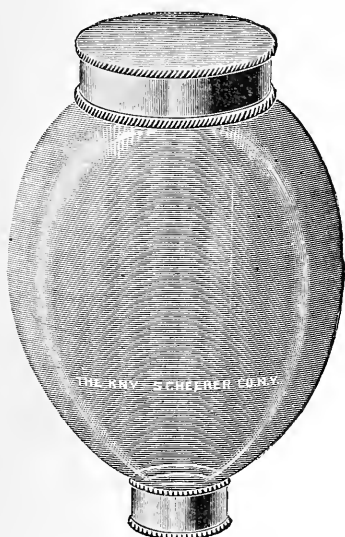


Fig. 14a—Blue Glass Sputum Flask with Dettweiler End Piece.

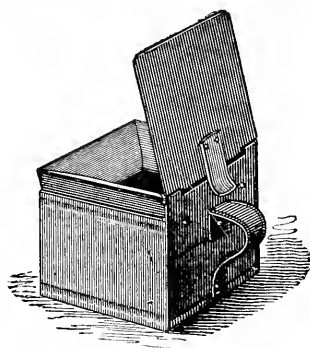


Fig. 15 — Frame for Seabury & Johnson's Sputum Cup.

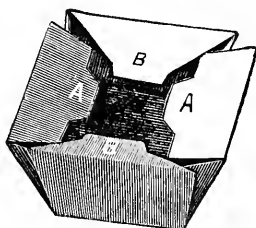


Fig. 16 — Pasteboard Cup for Seabury & Johnson's Frame.

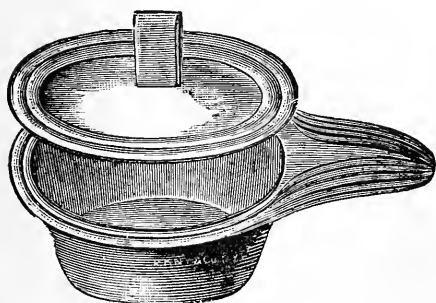


Fig. 17—Pasteboard Sputum Cup for Bedside.



Fig. 18—Metal Spit-Cup for Bedside.

handled more than necessary, but should be placed in water as soon as possible after removal from the bed or body. It is better to wash these articles separately, and only after having

been thoroughly boiled should they be put with the common laundry. Whenever it is not possible to carry out these precautionary measures in their entirety, one should strive to follow them as far as it is in one's power.

#### INGESTION OF TUBERCULOUS FOOD

Against the danger from infection through tuberculous food we will say that whenever one is not reasonably certain that the meat he eats has been carefully inspected and declared free from disease germs, it should be very thoroughly cooked. By this means one is certain to kill all the dangerous microorganisms. Against the sale of tuberculous milk, there are very excellent laws in some States of the Union which are rigorously enforced. In some the laws are less good, and in some there are no laws at the present time. In justice to farmers and dairymen it must, however, be said that there are many who do their very best to protect themselves and their fellow-men from the danger of tuberculosis. They have their cows tested regularly, destroy the animals which are found to be tuberculous, and keep their stables and utensils for milk as clean as possible. Unless one can be reasonably sure that the cows from which the milk is derived are healthy and not tuberculous, the milk should be boiled or sterilized before use, especially when it is intended as food for children. Milk obtained from stores and from milk peddlers should invariably be submitted to boiling or sterilization. When milk is kept slowly boiling for five minutes, all the bacilli are killed, and the same result is obtained by the sterilizing process—that is to say, to keep the milk heated for at least half an hour at a temperature of about 70 degrees Centigrade or 160 degrees Fahrenheit. There are now in the market a number of cheap and practical apparatuses for sterilizing milk which can be obtained at almost any drug store.

Raw fruit bought from the push-cart man, or, for that matter, derived from any other source, should be washed, peeled, or cooked before being eaten.

There is another possibility whereby the germs of consumption may enter our stomachs or intestines, namely, through kissing the consumptive, or using utensils which have been soiled by the saliva of the patient. Therefore, the consumptive should never kiss, no matter whom, on the mouth, and children should be taught not to allow any one to kiss them except on the cheek or not at all. Tuberculous patients should have their own drinking glasses, spoons, forks, etc. ; or, at least, all table utensils which have served the tuberculous patient should be sterilized in boiling water after use.

It is, of course, also possible that the consumptive may contract intestinal tuberculosis when he, out of false modesty, swallows his expectoration. He should also remember never to touch food before having washed his hands very thoroughly. Even with the greatest care it is possible that he may have soiled his hands with tuberculous expectoration.

#### INFECTION BY INOCULATION

Inoculation, or the penetration of tuberculous substance through the skin, happens perhaps most frequently through injuries received while cleaning nickel or chipped glass or porcelain cuspidors which have been used by consumptives. It is also possible for the bacilli to enter the circulation if the person cleaning the spittoons happens to have a wound or open sore on his hands. Persons intrusted with the care of the spittoons in a private home or an institution for consumptives should wear rubber gloves while cleaning these vessels. At times the patient may inoculate himself by placing an accidentally injured finger in his mouth, or by carelessly soiling an open wound with his expectoration. Physicians, students of medicine or veterinary science, butchers, etc., are also exposed to the danger of wounding themselves with instruments which may have come in contact with tuberculous matter. Extreme care is the only remedy for all persons thus exposed. If one has been unfortunate enough to receive injury and tuberculous inoculation is feared, the best thing to

do is to let the wound bleed freely, wash it thoroughly with water that has been boiled, with a five per cent solution of carbolic acid, or with pure alcohol; dress the wound with a clean rag dipped in any of these liquids, and seek as soon as possible the advice of a physician.

I have thus far only spoken of tuberculosis which manifests itself in the pulmonary form—that is to say, consumption of the lungs, of intestinal tuberculosis—that is to say, consumption of the bowels, and tuberculosis of the skin, or lupus. But you must know that every organ in the body—such as the throat, the bones, and the covering of the brain and spinal column—is also not infrequently invaded by the tubercle bacillus. In the last form the disease is technically called tuberculosis meningitis.

#### NATURAL RESISTANCE OF THE HEALTHY INDIVIDUAL

After all that you have heard so far of the contagiousness, or rather the communicability of tuberculosis, and consumption in particular, I do not wish you to think that a breath in the atmosphere accidentally laden with bacilli would certainly render a healthy individual consumptive, or that by a swallow of tuberculous milk, or a little injury from a broken cuspidor, one must necessarily become tuberculous. The secretions of our nasal cavities, doubtlessly also the blood, and the secretions of the stomach of the healthy individual, have bactericidal properties—that is to say, they kill the dangerous germs before they have a chance to do harm. Therefore, the healthy man and woman should not have an exaggerated fear of tuberculosis, but they should, nevertheless, not recklessly expose themselves to the danger of infection.

But who are the individuals who must be particularly careful so as not to be attacked by the almost ever present tubercle bacillus?

#### PREDISPOSITION

There are four classes: First, those who have a hereditary predisposition to consumption; secondly, those who have

weakened their system and thus predisposed themselves to consumption by the intemperate use of alcoholic beverages, by a dissipated life, by excesses of all kinds, etc. ; thirdly, those whose constitution has been weakened through disease—for example, pneumonia, typhoid fever, small-pox, measles, whooping-cough, syphilis, influenza, etc. ; fourthly, those whose occupations, trades, or professions, such as printing, hat-making, tailoring, weaving, and all occupations where the worker is much exposed to the inhalation of various kinds of dust, have rendered them particularly liable to consumption.

#### HEREDITARY CONSUMPTION

Before I proceed to give you a few of the essential points how to overcome such a predisposition to consumption, let me answer the question: "What about those who have a so-called hereditary consumption?" Permit me to say that the popular notion concerning hereditary consumption is in my humble opinion absolutely erroneous. Consumption has perhaps never been inherited either from the father or the mother, but the child has usually been infected by its well-meaning but ignorant consumptive parents after birth. The mother has kissed the child, taken it into her bed, allowed it to use the same spoons and utensils which she has used herself, and thus unconsciously has conveyed the disease to her infant. Through kissing and caressing a consumptive father, the child may also be infected; or again, either the one or the other parent may have been careless with their expectoration, may have spat on the floor where the child plays. It must be obvious to any thinking individual that if such uncleanly habits of the father or mother prevail the healthy-born child is not liable to remain healthy long.

I have said that consumption is not hereditary, and children born of consumptive parents need not necessarily contract the disease. I myself have seen children of a consumptive parent grow up to be strong men and women. But their parents were not only careful, clean, and conscientious; they were also

aware that, while they did not transmit consumption to their children, they have transmitted to them a tendency, or predisposition, to this disease. This hereditary predisposition is, however, a condition which can be overcome by judicious training, proper food, plenty of outdoor exercises, and the avoidance of all excesses. Every predisposed individual should dress sensibly and according to the season. Never should they wear garments which restrict circulation or hinder the free physiological function of the chest or abdomen. Tightly laced corsets, tight neckwear, tight shoes, are all pernicious and particularly dangerous to the individual predisposed to tuberculosis.

#### ALCOHOLISM

A predisposition, whether inherited or acquired, may be explained as a peculiar weakened state of the system which offers a favorable soil for the growth and multiplication of the germs of consumption. I have already said what should be the duty of the parents if they are themselves consumptive and fear to have transmitted to their offspring a predisposition to the disease. Concerning alcoholism and other intemperate habits, which are so often the forerunners of consumption, I desire to speak plainly. I do not wish to appear to you as a temperance lecturer, condemning all and everything which does not subscribe to the doctrines of the temperance party. I consider alcohol a medicine, at times indispensable in the treatment of certain diseases; but liquor as a beverage is never useful and nearly always harmful. Alcoholism must be considered the greatest enemy of the welfare of a nation, the most frequent destroyer of family happiness, the cause of the ruin of mind, body, and soul; and certainly the most active co-operator of the deadly tubercle bacillus.

To combat alcoholism (drunkenness or intemperance), education above all is required. Extreme prosecution and fanatical laws will do little good. From early childhood the dangers of intemperance and its fearful consequences should be taught.

In schools and at home the drunkard should be pictured as the most unhappy of all mortals. While the very moderate use of feeble alcoholic drinks, such as light beers, may be considered as harmless to adults when taken with their meals, alcohol should never be given to children, even in the smallest quantities. In families in which there is a fear of hereditary transmission of the desire for strong drink, even the mildest alcoholic drinks should be absolutely avoided. It would also be best if all people so predisposed, or who may have acquired only the occasional desire for drink, would never smoke, for experience has taught that attacks of dipsomania (periodical sprees) are often caused by an excessive use of tobacco. The young man starting out in life should take with him the moral training which will enable him to be a gentleman, and be considered a polite gentleman, though he absolutely refuses ever to enter a liquor saloon in order to treat or be treated to drink. It is this treating habit—alas! so prevalent in our American society—which has ruined many a young man and made him a moral and physical wreck. The creation of tea and coffee houses, where warm, non-alcoholic drinks, including bouillon, are sold in winter and cool ones in summer, is to be encouraged. It would be of additional advantage if some of these houses could also offer healthful amusements for old and young. Temperance societies, which through tactful and intelligent propaganda help to combat the fearful evil of alcoholism, should receive encouragement from everybody.

There is another point in regard to alcohol and tuberculosis I wish to emphasize, and that is the idea that alcohol is a remedy or even a specific remedy for consumption. There has never been a greater mistake made. Alcohol has never cured and never will cure tuberculosis. It will either prevent or retard recovery. It is like a two-edged weapon: on one side it poisons the system, and on the other side it ruins the stomach and thus prevents this organ from properly digesting the necessary food. Truly pathetic are the results of this erroneous doctrine in the families of the poor, where, instead of procuring good nourishment for the invalid, liquor has been

bought in far too large quantities, so that often there was not enough money left for food for the sufferer nor for the other members of the family.

#### DISEASES AND OCCUPATIONS WHICH PREDISPOSE TO CONSUMPTION

The individual enfeebled by disease, such as typhoid fever, grip, etc., should lead a particularly careful life and avoid crowded meeting-places and all localities where the air is vitiated and where he is in danger of coming in contact with careless or ignorant individuals who expectorate everywhere. Men who have a trade, such as printers, tailors, bookkeepers, or other workers whose occupations are more or less predisposing to tuberculosis, can render their work relatively healthful by leading a sober life and, when not at work, spending as much time as possible in the open air, by breathing deeply and keeping the body in a thoroughly good condition through regular bathing and judicious exercise.

#### THE CURABILITY AND MODERN METHODS OF TREATMENT OF CONSUMPTION

I have taken for the title of my address to-night "The Duties of the Individual and the Government in the Combat of Tuberculosis," and I believe I have said all I could in the brief space of time allotted to me of the duties of the consumptive, of those living with him, of those who are in fear of becoming consumptive, and of the parents who may have transmitted to their children a predisposition to the disease. The duty of the individual who is not included in these four classes is to make himself acquainted with the facts stated. Every one, whether he is consumptive, or lives with consumptives, or has nothing whatsoever to do with consumptives, should know the few principal sources for the propagation of the disease and the means to combat them. It should be known to every one that consumption is an infectious, com-



municable, preventable, and curable disease, and that in the early stages the cure is often accomplished as many as seventy-five to eighty-five times out of a hundred. What is most interesting to know is that this cure can not only be accomplished in California, or Colorado, but also in our own home climate; not, however, by quacks and patent medicines, but by the scientific and judicious use of fresh air, sunshine, water, abundant and good food (milk, eggs, meat, vegetables, fruit), and the help of certain medicinal substances when the just-mentioned hygienic and dietetic means do not suffice in themselves to combat the disease.

The thorough and constant supervision of the pulmonary invalid, the immediate intervention when new symptoms manifest themselves or old ones become aggravated or do not disappear rapidly enough, the prescribing of proper food and drink, can only be done by the thoroughly trained physician, either in the home of the patient or a properly conducted sanatorium.

Before proceeding to point out to some individuals their special duties in the combat of tuberculosis, I would like to say a word which applies to all. On every one with the knowledge of the prevention of consumption, knowledge which he may have possessed already or which I may have been fortunate enough to convey to him, I think it my duty to impress the fact that he can do something toward the combat of the disease.

#### THE DUTIES OF THE INDIVIDUAL CITIZEN

If you are in the presence of a consumptive who is not yet under medical care, teach him what you know of the prevention of the disease and advise him to seek the counsel of a competent physician. If he is too poor to pay for a consultation, and too proud to ask it for nothing, tell him to apply to the health department, which will send one of its physicians without cost. No tuberculous invalid, no matter in what stage of the disease, whether living in a palace or in the poorest tenement house, should be without a medical adviser. If you

meet a consumptive who is ignorant of the precautions he should take, do not shun him like a leper, but treat him with kindness, and convince him that whatever he does to prevent the spread of the disease among others will also improve his own condition and increase the chances of his recovery. Let me tell you that a clean, conscientious consumptive is as safe a person to associate with as anybody. If in your daily life you can influence others to make themselves familiar with the necessary knowledge of the prevention of tuberculosis, do so! If through your influence, your words, and example you can combat the fearful curse of our nation—alcoholism—I beseech you, do your duty.

Some individuals have, by virtue of their calling, a special duty to perform in the combat of tuberculosis. Of these I mention, first, the teachers of the public schools, the clergymen, the editors of the public press, employers and philanthropists.

#### THE DUTIES OF THE TEACHER

The teachers of our public schools should not only be familiar with the ordinary methods of preventing the spread of the disease, preach and practise in their classrooms ample ventilation; but they should also be familiar with the general appearance of the tuberculous child, so that they may call the attention of the school physician or the parents to the condition of the pupil. It should be known that bone and joint tuberculosis is most frequently manifested in childhood. The early symptoms of tuberculosis of the bones and joints show themselves in the lameness and easy tiring of the arms or legs affected. If the spinal column is affected, the symptoms will depend upon the location of the vertebra which is attacked by the disease. Scrofulosis, which is only a milder form of tuberculosis, and which is even more frequent than bone tuberculosis in children, is easily recognized. The scrofulous child is usually pale, with flabby skin and muscles. The glands around the neck are swollen, and skin disease, sore eyes, and running ears are frequent symptoms. The little patient usually mani-

feats a phlegmatic condition, but we may also find some that are nervous and irritable. The latter often have a peculiarly white, delicate skin, which makes the veins visible. Fever may be observed in some children. In view of the happily very curable nature of scrofulous affections, the importance of the early recognition and of the timely and judicious treatment is, of course, self-evident. This scrofulous condition may be either inherited or acquired. The hereditary type comes from parents who are scrofulous, tuberculous, or syphilitic. It has also been proved that when one or both of the parents were alcoholics, that is to say, addicted to the chronic use of intoxicants, their offspring have become scrofulous.

All this shows how dangerous it is for weakly and sickly persons, or those afflicted with any of the above-mentioned diseases, to marry and have children before being completely restored to health. We wish to state again that all these diseases can be cured by timely medical treatment. To be cured from alcoholism, the physician's help is not always necessary. In most cases it requires only the earnest and honest endeavor to abstain.

The principals of schools should make it their duty to incorporate in the curriculum of all classes gymnastics and outdoor exercises and play. The mental development of our children, valuable as it is, should never be pushed to the detriment of their physical development and well-being.

#### THE DUTIES OF THE CLERGYMAN

The clergymen, too, should inculcate these ideas into the minds of the people under their charge; and they should, too, feel pride in having their churches hygienically constructed and well ventilated. Fixed carpets should not be used in places of worship where so many people congregate. Catholic priests in charge of large congregations may do well to follow the example of the great Roman divine, the Bishop of Fano in Italy. In a circular recently issued by him, he asks the priests of his diocese to comply with the following rules:

“(1) In every church, the floor must be regularly cleaned with sawdust, saturated with a strong sublimate solution. This thorough cleaning should take place particularly after holidays when great masses of people have visited the church.

“(2) Every week all ordinary chairs and confessional chairs must be thoroughly cleaned with moist rags.

“(3) The grate of the confessional chairs must be washed every week with lye and then polished.”

It might be of advantage if such articles of adoration as crosses, statues, or, as in Greek churches, pictures, which are often kissed by devout Catholics, be included in the periodic disinfection. Kissing the Bible when taking an oath should be discouraged by jurists and divines.

Ministers of all denominations should consider it beneath their dignity to allow their names to be used to advertise patent medicines and other secret remedies. I am convinced that if they were aware of the fact that many of the advertised patent remedies contain as much as thirty and forty per cent of alcohol and often other dangerous ingredients, they would refrain from indorsing the use of medicines of whose composition they have not the least idea. Neither should religious newspapers lend their columns to the advertisement of nostrums and patented remedies of all sorts. It is to be regretted that patent medicines are also not infrequently recommended by statesmen and legislators. Their personal indorsement of this or that secret remedy, given without forethought and perhaps even with good intentions, has often done irreparable harm to the sufferers.

#### THE DUTIES OF THE PUBLIC PRESS

Of the duties of the public press in this fight against the “great white plague,” the most formidable disease of the masses, I cannot speak earnestly enough. Our daily and weekly papers have already done much good in disseminating knowledge regarding the prevention of consumption. By continuing to spread the literature of the various associations and

committees on the prevention of tuberculosis as a disease of the masses, they do perhaps more than any other agent.

#### UNSCRUPULOUS QUACKS AND THEIR METHODS OF ADVERTISING SO-CALLED INFALLIBLE CONSUMPTION CURES

Unfortunately, the public press serves also for the advertising of the many "absolutely sure consumption cures," which are from time to time put on the market by unscrupulous quacks. I am nevertheless sanguine enough to hope that in time the better class of newspapers will, in the interest of the community at large, no longer extend the hospitality of their columns to such dangerous advertising matter, especially when it is protested against by the intelligent reader. How many poor consumptives have lost their last little reserve fund by giving everything they had for a dozen bottles of the "sure and quick cure," only those who come much in contact with them know. How unscrupulous some of these charlatans are in their method of procuring certificates of cure, which they then publish as bait to the unfortunate help-seeking sufferer, is something which can hardly be believed. Let me tell you of one instance: A poor woman in the last stages of consumption came to me seeking advice. When asked for the name of her former medical attendant, she confessed that she had been treated for a number of weeks by a quack concern, and now, her means being exhausted, she was made to understand that they would not continue to treat her unless she would give them a certified testimonial that she had been thoroughly cured of her disease, which had been pronounced an advanced case of consumption by prominent physicians. This poor sufferer had not derived any benefit whatsoever from the treatment, and as a result her conscience would not permit her to become a partner to such a fraudulent procedure.

Some of these unscrupulous concerns resort to absolute fraud to beguile the public by using the name of the great scientist and benefactor, Prof. Robert Koch, of Berlin, as though he were associated with them in their business and treatment.

They advertise his picture beside that of an individual with a similar name, and are heading their advertisements as "Professor Robert Koch's Cure." While the medical profession at large was, of course, aware of this evident fraud, the public did not seem to be, and in order to be able to give an official denial of any such connection, a member of the Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York City wrote to Prof. Robert Koch of Berlin, Germany. The professor's answer was a lengthy one and full of indignation, and I will give you only the substance of it. He says that the alleged "lung cure" of Dr. Edward Koch, or under whatever name this system of treatment may be presented to the American public, is a very base fraud, and that he, Geheimrath Professor Dr. Robert Koch, has no relations whatsoever with Dr. Edward Koch, with any other individual who may be connected with this concern, nor with any of its methods of treatment; neither has he ever had any relations with the same. He hopes that the Committee on the Prevention of Tuberculosis may be successful in putting an end to this base and fraudulent concern. This is to be particularly desired in the interest of the many poor consumptives who have been deceived by the use of his name in connection with the so-called Koch's Consumption and Asthma Cure.

There are numerous other concerns which put their secret consumption remedies on the market and resort to all sorts of illegitimate means to make people believe that their "cures" are endorsed by the profession. Some claim to have the endorsement of the British Congress on Tuberculosis, others to be members of that congress; some even resort to most cunning means to make it appear that members of the Tuberculosis Committee of the New York Charity Organization Society endorse their treatment. These remedies, when not harmful concoctions, are sometimes commonplace medicines prescribed daily by the profession. One firm puts up the prescription for a tonic given by a certain Vienna physician, a former assistant to a polyclinic (dispensary). The drug firm calls this doctor "the great Vienna Professor." An individual

alleged to have been cured from consumption by "the Professor," with the aid of the remedy now put up by this firm, is exhibited in the drug store as a living testimony of the great value of the anti-consumption remedy for sale there.

The misuse of the name of the Committee on the Prevention of Tuberculosis and of some of its members has become so intolerable that the following resolutions were adopted recently by the committee, and the lay press has been requested to give them the largest possible publicity:

"Whereas, It has come to the knowledge of the Committee on Tuberculosis of the Charity Organization Society that many so-called specific medicines and special methods of cure for tuberculosis have been and are being exploited and widely advertised, and

"Whereas, The advertisements of some of these cures have made such reference to the Tuberculosis Committee of the Charity Organization Society, or to some of its members, as to create the inference that this committee, or its members, recommend or advocate the use of many such so-called specifics or special methods of cure for pulmonary tuberculosis, or consumption; and

"Whereas, There is no specific medicine for this disease known, and the so-called cures and specifics and special methods of treatment widely advertised in the daily papers are in the opinion of the committee without special value, and do not at all justify the extravagant claims made for them, and serve chiefly to enrich the promoters at the expense of the poor and frequently ignorant or credulous consumptives; therefore,

"*Resolved*, That a public announcement be made that it is the unanimous opinion of the members of this committee that there exists no specific medicine for the treatment of pulmonary tuberculosis, and that no cure can be expected from any kind of medicine or method except the regularly accepted treatment, which relies mainly upon pure air and nourishing food."

## VALUE OF EDUCATING THE PUBLIC

To break the nefarious trade of the man who deals in "sure and infallible" consumption remedies, to stop the practice of the man or woman who claims to be able to diagnose and treat consumption by letter, the Christian scientists, the faith curists, who ridicule preventive measures and the laws of cleanliness and hygiene—which are the laws of God—but who, as a token of faith, demand their fees in advance; we have but one weapon, and that is education—education by a conscientious press, the clergyman, and the teacher.

## THE DUTIES OF EMPLOYERS

Factories, workshops, stores, offices, etc., should be sanitarily constructed and well ventilated; but besides this there are other things which the employer can do in the combat of tuberculosis. In factories, workshops, stores, offices, etc., there should always be a sufficient number of spittoons, preferably elevated and of unbreakable material. Wherever such precautions are taken and some conspicuous signs, forbidding expectorating on the floor, put up, and if necessary, making it punishable by law, promiscuous spitting will soon cease, and an important point in the combat of tuberculosis will be gained.

All employees, men and women, of whatever class, should be allowed ample and regular time for their meals, which should never be taken in the workshops. Lastly, employees should not be overworked. There should be reasonable hours for all, so that the laborer may enjoy the bodily and mental rest which is essential to the preservation of health. The germs of any disease, but particularly those of tuberculosis, will always find a more congenial soil for development in an overworked and enfeebled system. Child-labor, that is to say, the employment of children under fourteen years of age, in factories, workshops, mines, etc., should be prohibited by law. The child is more susceptible to tuberculosis than the adult,



especially when its delicate growing organism is subject to continued physical strain. That there are still sections in our country where child-labor is permitted to exist, is one of the saddest and most disgraceful blots upon the fair name of our nation.

#### THE DUTIES OF THE PHILANTHROPIST

It is hardly fair to speak of the duty of the rich as philanthropists, for philanthropy is a voluntary act, and the rich man cannot be compelled to give some of his wealth to his less fortunate fellow-men. Still less have we a right to dictate to a millionaire how to dispose of his wealth though he may be philanthropically inclined. This country has, nevertheless, a right to be proud of many of its rich men and women, and I am the last to underestimate the fortunes which have been given to the various educational and religious institutions by our Carnegies, Rockefellers, Vanderbilts, Morgans, Piersons, Schiffs, our Helen Goulds, Phœbe Hearsts, Emmons Blaines, etc., but it is natural that those of us familiar with the needs of the consumptive poor in this country should look for help in solving this difficult tuberculosis problem to the large-hearted American men and women who make such noble use of their wealth. There are now, perhaps, plenty of libraries and colleges, and even general hospitals, everywhere; but there is a scarcity of public baths, which should, at a moderate price, be at the disposal of the people every day, winter and summer, and for some hours in the evening. There is a scarcity of decently kept places of amusement, open all the year, where the laborer and his family may spend a pleasant Sunday afternoon and partake of non-alcoholic drinks. There is a scarcity of hospital and sanatorium facilities for thousands of poor consumptives who could be cured if only taken care of in time. Sanatoria for consumptive adults, as well as seaside sanatoria for scrofulous and tuberculous children, are a crying and urgent need for the majority of our large American cities. The more consumptives we cure the more bread-winners we create, and the fewer people will become burdens to the communities. As

the conditions are now, in most of our cities and towns, the majority of consumptives are doomed to a certain and lingering death; and if they are careless or ignorant of the necessary precautions they will infect some of their own kin and neighbors.

There are from ten to fifteen thousand consumptive poor in New York City, and there is hardly hospital and sanatorium accommodation for one thousand. The remainder are not treated at all, or receive what treatment is possible in the homes of the poor. Recent statistics, compiled by the department of health of the city of New York, show that during the past year 1,750 consumptives, who were finally received and have died in the public hospitals, had been homeless. They had slept in cheap lodging-houses, hallways, or wherever they could find shelter for the night. Thirty-seven of them were found dead in such places. What do these many homeless cases mean when viewed as sources of infection? This must give food for thought to statesman, sanitarian, and philanthropist alike.

Would that I could take some of our philanthropic friends to our densely crowded tenement districts and show them there the suffering of mind and body of the poor consumptive, who must die, not because his disease was incurable, but because there was no place to cure it. I am convinced that if our generous and wealthy fellow-citizens would but see for themselves these conditions, instead of more libraries, universities, and colleges, we would soon have better tenements, more playgrounds and parks for children, and an abundance of sanatoria and hospitals for our consumptive poor.

A few more gifts, such as recently bestowed by Charles M. Schwab in the shape of an extensive and beautiful playground to the children of New York, and by Henry Phipps, in the shape of a tuberculosis institute for Philadelphia's consumptive poor, will work wonders in the reduction of the mortality from tuberculosis.

Concerning the recent magnificent donation of Mr. Rockefeller of seven million dollars to search for a specific medicine to cure consumption, I could wish that the University, repre-

senting the city of Chicago, which is the recipient of the gift, were allowed to use the greater portion of these millions for the purchase of the worst tenements in that city and the erection of model houses for the laborer in their stead; for the establishment of a few playgrounds; for public baths, and last, but not least, for the establishment and maintenance of sanatoria for the poor and moderately poor consumptives.

## THE DUTIES OF THE MUNICIPAL GOVERNMENT

It remains only for me now to speak of the duties of the government. First, what is the duty of the local or municipal government in the combat of tuberculosis as a disease of the masses?

Each city should have an efficient committee on tuberculosis composed of a number of general practitioners, health officers, and trained charity workers. This commission should have its offices in a building connected with a special dispensary for tuberculous patients. Each case applying should be carefully examined for the following purposes:

(1) To determine the applicant's condition by medical examination.

(2) To visit his home if he has been found tuberculous, and to institute such hygienic measures as seem necessary (distribution of pocket spittoons, disinfectants, etc., gratuitously if the patient is poor).

(3) To examine the other members of the family, in order to find out if any of them have also contracted the disease, and, if so, to counsel proper treatment.

(4) To report in full to the sanitary authorities concerning the condition of the patient's dwelling. Its renovation or even destruction may be imperative when it is evident that tuberculosis has become "endemic" there, owing to the condition of the soil or to other sanitary defects.

(5) To determine the financial condition, whether the patient is or is not able to pay, and whether or not, by his being taken to an institution, the family will become destitute.

If the latter should be the case, it would be necessary for provision to be made in some way for the family. In many cases a letter of inquiry sent to the former medical attendant of the patient would materially aid in the work of the investigating committee.

Any individual should have the right to present himself for examination, and every physician should be at liberty to recommend any person for examination to the board of his precinct or district.

Every city should, of course, have an efficient health department, a building department, tenement-house commission, street-cleaning department, and a board of education, all of them combining to render the city as sanitary as possible and thus combating centres of contagion of tuberculosis and other diseases, keeping our streets as free from dust, filth, and smoke as possible, preventing the construction of unsanitary, unsafe dwellings and the overcrowding in homes, sweat-shops, and factories, and making of the public schools where our children dwell so many hours models of perfect ventilation and places for true intellectual and physical development, thus furthering the physical and moral welfare of the entire community.

#### THE DUTIES OF THE STATE GOVERNMENT

Our state legislators should do their utmost to enact such laws as will secure always proper ventilation and light in public and private buildings. How necessary such laws are, you will believe when I tell you that there are in Manhattan over 200,000 and in Brooklyn over 125,000 dark interior rooms without a window of any kind, and having no means of light and ventilation. Such attempts as are now before the New York legislature to cripple the work of the tenement-house commission and allow greedy contractors to continue to erect tenements without light and air, veritable breeding-places of consumption, should receive the just condemnation of every citizen in the land.

## PREVENTION OF TUBERCULOSIS IN CATTLE

Another feature in the combat of consumption, which to my mind has been somewhat neglected, is the prevention of tuberculosis among animals, for notwithstanding Professor Koch's recent declaration at the tuberculosis congress in London, there is still too much evidence of the possibility of the transmission of tuberculosis from the bovine to the human race. If I am rightly informed, there is an amendment proposed by the Live Stock Association which would enable them to keep cattle in transit for forty consecutive hours without food or water. From an unsigned letter to the editor of the *Evening Post*, of January 29, I quote as follows: "The law as it now stands—depriving the unfortunate animals of those necessities for twenty-eight consecutive hours, through summer's torrid heat and winter's chill—is inhuman enough. To extend this limit of endurance would, indeed, stamp us as a barbarous, disgraced nation, not only in the eyes of the world, but what is worse, in our own estimation. The greed which would tempt a \$600,000,000 organization to impose such a national inhuman stigma should call for loudest condemnation from the government, from the press, and from individuals."

Let me add that we should not forget that close proximity of diseased and healthy individuals, lack of air and food, and other privations, are causes of the propagation of tuberculosis, not only among men but among animals as well, and that consumptive cattle may give consumption to man.

## THE DUTIES OF THE FEDERAL GOVERNMENT

State boards of health should receive ample appropriation to combat tuberculosis among men and animals and be helpful in creating state sanatoria and agricultural colonies for consumptive adults, and seaside sanatoria for scrofulous and tuberculous children; also special hospitals and tuberculosis dispensaries; and lastly, the United States Government should, after the example of Great Britain, France, and Germany; not only have

a ministry of public health, but also a special commission, appointed by the President of the United States, composed of expert sanitarians, physicians, and veterinarians, who should unite with the state and municipal sanitary authorities of the country in the combat of tuberculosis in all its forms among man and beast.

#### CONCLUSION

If every individual in his respective sphere, and the local, state, and Federal governments, would do his full duty in the combat of this fearful scourge of mankind, so justly called by Oliver Wendell Holmes "the great white plague," I am convinced that before many decades tuberculosis would be eradicated from our midst, and the United States would have the honor of being the first among the nations of the earth to have accomplished this great and glorious work.

APPENDIX 8

# TUBERCULOSIS AND CHILDREN

By A. JACOBI, M.D.





## TUBERCULOSIS AND CHILDREN

TUBERCULOSIS kills as many people, old and young, as diphtheria, croup, whooping-cough, scarlatina, measles, and typhoid fever taken together. In many of our cities, principally New York, measures have been taken to reduce the fatality of the latter. Until a few brief years ago none was taken, however, to reduce the mortality from tuberculosis. But the attention, both of the general public and the authorities, has now been directed to the means of its alleviation and future extinction. Movements have been organized to spread the knowledge of its causes, prevention, and cure.

In writing of tuberculosis as it appears in the young, I need only refer to the fact that it is an infectious disease due to the presence of a specific microbe called tubercle bacillus, is a disease which runs its course acutely in a few weeks or chronically in dozens of years, and is liable either to remain dormant and the patient to get practically well, or to lead to a speedy death. It is located in, or takes its origin from, one of a number of different organs. It may run its full course to recovery or to death in a single organ, or may be traced to a number of organs at the same time. It is best known among us in the lungs, under the name of pulmonary consumption. This is the usual form it takes in the adult. It is almost always transmitted by the inhalation of bacilli which are contained either in the moist air surrounding the coughing consumptive, or in the dry dust of rooms, halls, and streets.

Pulmonary consumption is a frequent disease in all countries, and in most nations of Europe one-third of the working popu-

lation between their fifteenth and sixtieth years die of it. The same form of pulmonary tuberculosis is not frequent in infancy, but is quite frequent in childhood; the tubercular infection has, however, many more sources and locations in the young than in the old. Some of the forms in which tuberculosis makes its appearance in the young I shall merely mention, in order to recall to your minds such instances of the disease as you have seen but perhaps not always recognized, and to present many forms of it that frequently sail under a false flag. I shall be brief, for my object is rather to point out some of the many ways in which tuberculosis may invade the young, and those methods by which it may be prevented.

A frequent place in which tuberculosis may be found is the bone. Here, in the infant and child, it is very frequent. Go to any dispensary or college clinic; go to the Hospital for the Ruptured and Crippled in Forty-second Street, New York; to the Orthopædic Hospital and Dispensary in East Fifty-ninth Street, or to the Tarrytown State institution. The bone abscesses of the fingers, the feet, the knees, the hip, the spine, with its Pott's disease and life-long deformities in those who survive, are mostly of tuberculous origin. Another form of tuberculosis may be studied when it develops in the peritoneum of the young. I say of the young, for in the adult this form is rare. The child of from three to eight or more years, either pale and haggard or apparently robust, may complain of abdominal pain, which is either spontaneous, or elicited by pressure. Among the main symptoms is the swelling of the abdomen, which is caused by local dropsy. In the well-to-do classes, this peritoneal tuberculosis is very apt to heal spontaneously or under medicinal treatment, or after a slight operation. In the poor quarters recovery is possible, but very slow; the majority of patients will finally succumb under the influence of generalized tuberculosis. This simple fact is one of the thousand which teaches that mutual responsibility, that equality, fraternity, and solidarity are still far away, if not utopian, and that human society is not yet humane.

Another grave form, also almost exclusively met with in the

young, is meningeal tuberculosis. Tubercular tumors, sometimes found in the brain—mostly of the young—are always fatal. Tuberculous inflammation of the brain membranes is a frequent disease. Up to the second year, its symptoms are attended with great vehemence, high temperature, early convulsions, and rapid death. Between the second and ninth year, the symptoms are as follows: Pallor, changed temperament, morose or irritable, bad headaches, slow and irregular pulse, vomiting, slow increase of the body temperature, dilated pupils, some form of convulsion, constipation and diminished urine, congestion of head and face, high temperatures, and death. Many know the disease on account of its frequency. The almost universal result is death after from three to five weeks. There are only a few authenticated cases of recovery. My friend, Professor Biedert of Hagenau diagnosticated a case which got well. The child died after a few years of an acute disease, an autopsy was made, and the traces of the old tubercular meningitis were found. This is a clear case, very exceptional, on the part of a reliable diagnostician, of recovery. But would the recovery have been permanent? If the child had not died in young years, would the physician still speak of a complete recovery? Nobody can tell. Listen to a single instance among my observations. About forty years ago I diagnosticated a case of tubercular meningitis in a boy of three years. He got well; that is, he did not die. For some years there were no particular complaints. But the child's temper was changed, he was bad, became more irritable, vehement, violent, and sometimes dangerous. He was a slow learner except of the use of his muscle. He remained wayward, with sudden outbreaks of malice, irresponsible, unreliable. When he reached his twentieth year, he also reached the insane asylum; where he still is, to remain as long as he lives. We called that a recovery with which we were proudly delighted. Why do I write of such a case? To impress you with the fact that tuberculosis of the brain and its meninges is frequent in infancy and childhood, that it is almost always fatal, and that even apparent escapes are not necessarily recoveries. And

finally, as there is practically no escape from the established disease, in this form at least, the duty is to look, where there is no cure, for preventives. And that is possible.

You will have noticed that all these forms of tuberculosis are mostly the prerogatives of the young. Diseases of an irritative, congestive, or inflammatory nature, no matter whether primary or secondary, are mostly found in those young organs which are in a condition of physiological growth. The bones and the brain belong to that class. Their development in early years is very rapid, and the natural congestion required for normal growth is liable to become morbid. That is why an over-exerted organ at any age is liable to become diseased; for instance, the muscle in athletes, the heart in runners. One of the most active systems in the very young is the lymph system, consisting as it does of millions of smaller and larger vessels extending through the whole body and hundreds of lymph bodies located about the neck, in the armpit, in the groin, in the chest, in the gut and abdomen, all of which are active in conducting the chyle to the blood, and increasing and changing the number of white blood corpuscles. These lymph-bodies, falsely called glands, are mostly observed about the neck. They make their appearance in slight irritation of the mucous membrane of the nose, throat, or mouth, and are liable to disappear when that irritation is but temporary. They persist, and are mostly known as hard nodes or more or less deforming scars, under the denomination of "scrofulous glands," about the neck and other external and internal parts. These glands are not always tuberculous, but they may and frequently do become so. Tuberculosis of the glands of the neck may terminate in abscesses; of those in the chest, in chronic bronchitis and pulmonary tuberculosis; of the abdomen, in tubercular ulcerations of the bowels and in peritoneal tuberculosis, which I characterized above. Under certain circumstances even a mild congestive or inflammatory swelling of the lymph bodies or glands may become tubercular. That is why it is our object to study these circumstances, and to control and avoid them.

Direct heredity of tuberculosis is very rare, and as a statistical factor hardly counts. In fifty years of medical practice, I have seen a single unmistakable case; in medical literature there are only a few dozen, in man and animal together. When there are many cases of tuberculosis in a family, there is no hereditary transmission of the disease but rather a heredity of disposition, consisting in a defective structure of the tissues in general, combined with the frequent opportunity of communicating the disease. When a baby takes tuberculosis while lying in the lap of its mother, it succumbs not to heredity, but possibly, to a slight extent, to the influence of a tubercular breast milk, more certainly to a feeble structure of all its tissues—the mucous membranes of its digestive and breathing apparatus in particular,—and principally to the inhalation of bacilli from the air into which the mother coughs and from the dust of the room in which dry bacilli congregate. It is very probable that not many babies of a consumptive mother would perish from tuberculosis if it were possible to take them to the mother for the purpose of nursing only. Bad cases of maternal tuberculosis might even demand that the mother should wear a veil during nursing, in order to prevent the flying drops of expectoration from entering the air and the lungs of the infant.

What is the cause of the disposition of which I have spoken? I have mentioned the great disposition of young children to diseases of the mucous membranes. All young structures are less firm and less organized than those of the adult. As a matter of common experience, I mention only the frequency in the young of diseases of the nose and throat. Catarrhs are frequent; diphtheria is almost exclusively a disease of childhood. The majority of diseases and deaths in the first year of life are digestive; after that, respiratory. As I have said, absorption is more rapid in the young, and that is why prevention may be so powerful, while the cure of fully established tuberculosis is frequently a failure. Can this disposition to disease, this weakness of the structures, particularly of the mucous membrane, be overcome, and tuberculosis arising from that source be avoided?

Much has been said about hardening. What does it mean? Nothing but this: that the resistance of the child to the effect of external influences should be strengthened. Is there a uniform method applicable to every child, no matter of what age or constitution? Certainly not. But there is one object which should be accomplished in every infant and child; *viz.*, the invigoration of external circulation. The surface of a child from two to ten years measures from three to ten square feet. In and under that surface there is a lake of blood. In vigorous health this blood is in constant and rapid circulation; within two minutes it enters and leaves the surface, comes from and leaves the centre of circulation, the heart. Slow circulation in the surface retards the flow of blood in the whole body, and impairs the nutrition of the heart and every organ, causing congestion and insufficient function, and disease. Rapid circulation in and under the skin, causing rapid circulation everywhere, propels the totality of the blood in the child's body (from two to six pounds according to age—from two to twelve years) into and through the lungs, in which the contact with and the absorption of the oxygen of the atmosphere takes place. Now the best stimulant of the circulation in general is, besides muscular exertion (exercise), the stimulation of the skin by cold water and friction. A child of two or three years should have a daily cold wash, either after a warm bath, or standing in warm water which covers the feet, or lying on the attendant's lap, or on a mattress. A brisk rubbing with a wet towel, one or two minutes, and with a dry towel until the surface is dry and warm, is sufficient. Older children may have a wet sponge squeezed out over them, this procedure being followed by the same effective friction; or they may plunge into cold water, in the winter a single moment, in the summer several minutes. While in any bath, the skin should be thoroughly rubbed.

This rule must not become a routine applicable to every individual. Cold water and friction require a healthy heart and a certain degree of strength. They only facilitate the reaction that should be looked for in every instance. The same healthy

child, when taken sick or when convalescent from a disease, lacks the necessary vigor, and the routine must be interrupted. A child, under size and under weight, requires warmer water and friction. That is why a newly born baby or an infant of less than one or two years should be spared a low temperature. That is why also a child whose feet, after a bath or washing, do not get so warm as the rest of the body should be rubbed down not with cold but with warm water, or with a mixture of alcohol and warm water, until the constitution is gradually improved and fortified.

These rules appear simple; indeed, are simple. That is why the discussions of medical and lay journals met with lately are out of place. There are those who, with great earnestness, condemn hardening because they see colds, chills, pneumonia, and what not after cold-water treatment. If two do the same thing, it is not the same. It is with hygiene as it is with diet. The very young, the older, the healthy, and the sick, the robust, and the feeble, must not be treated nor fed according to ironclad rules. It has appeared to me that a few good rules, understood and intelligently applied, are a safer guidance than the forceful exhibitions of inexperienced medical juvenility as lately displayed in the magazines.

How is it that tubercle bacilli enter into the system? We are surrounded by them; there are very few of us whose noses and throats and mouths are not often inhabited by the microbes of tuberculosis, of diphtheria, probably of typhoid, of pneumonia. Why do they usually not harm us, and under what unfavorable circumstances do they enter our circulation? The answer is this: As long as the mucous membranes on which these unwelcome but ubiquitous guests are deposited are in a normal condition, these latter do not enter beyond the vestibule. It is very improbable that their mere presence changes the actual condition of their resting place. But rapid changes of the surface are common in the slightest alterations caused, for instance, by a common cold. A draught over your feet that makes you sneeze and shiver, that congests the mucous membranes and starts a sudden secretion that reminds you of

the waters of Babylon, disintegrates the fine epithelial covering. As soon as such a surface injury occurs, a simple throat catarrh may change into a diphtheria, the very vulnerable tonsils may admit into the circulation the microbes of rheumatism or of scarlet fever, a single bronchial catarrh will allow the poisonous pneumococcus to light up a pneumonia that may carry you off in three or six days. All this depends on a trifling occurrence, a draught between improperly opened windows, mainly in cold, wet weather; a wet stocking that is allowed to dry on your foot; an open trolley-car door while you are in perspiration. Tuberculosis may get in through any defect of the surface. It may enter the brain through the sore adenoids and mucous membrane of the nose; for indeed the direct lymph communication between the two surfaces of the skull, one inside the skull and the other in the nose and throat, is a very intimate one. I am certain, for example, that you have heard of instances in which the character and the mental capacities of a child were rapidly changed by the cutting out of enlarged tonsils and the scraping off of adenoids. There is no better proof of the intimate connection between different layers of circulation; in these cases between the external and the internal surfaces of the skull.

Tuberculosis of the tonsil itself is a very rare disease, but there is no reason why bacilli should not enter the circulation through its sore surface. Tuberculosis of the mouth is not quite so rare as it appeared to be formerly, for many a case that was called a cancer of the mouth turned out to be tubercular ulceration. The gullet and the stomach are not known as the points of invasion for tuberculosis, but the lower part of the intestinal tract certainly acts as a source of infection. Here we touch the question of the influence on the gut of substances that have been swallowed. What is it that is swallowed? Either food and drink, or the secretion of the nose and mouth, and the expectoration from the lungs during coughing.

First.—Food and drink. It has been assumed sometimes that the eating of meat from tuberculous cattle transmits tuberculosis. That is a mistake, and the destruction of tuber-



culous carcasses for that reason uncalled for. There are no tubercle bacilli in the muscle—that is, the flesh; if there were, meat is not taken raw, and boiling kills the bacilli. Drink, through which tuberculosis could be transmitted, means milk of tuberculous cows. Is it so very dangerous as it has been believed to be? It can be made uninjurious—that should never be forgotten—by boiling the milk a few minutes, or Pasteurizing it at 167 degrees Fahrenheit ten minutes. That will kill bacilli; and a dead bacillus is as harmless as the dead Indian of a certain grim soldier. But milk is not always boiled even for infants; not even in big cities in which it takes milk from four to thirty hours to get into the hands of the consumer,—a delay which is always injurious. Why is it not boiled? The reasons are ignorance, indolence, or, in some cases, the necessities caused by certain illnesses. Infantile scurvy, for instance—that peculiar disease with hemorrhages on the long bones, blue spots here and there, swelling and bleeding of the gums—is frequently the result of the overboiling of milk. In these cases, raw milk should be obtained and, as at least two per cent. of all dairy cows are tubercular, infected milk may get into the bowels of the infant. In a casual way I will just add that milk may easily be overboiled. Some people pride themselves on the thoroughness with which they recommend or practise boiling. But then it is not called boiling, it is called sterilization, and a foreign word of five syllables is so ornamental, don't you know. Proudly an affectionate mother tells you she sterilizes the milk her baby is to take, for thirty, forty, sixty minutes. She would not do less for her baby, not she. But she should know, or learn, that what is saved of milk after forty minutes' boiling is no longer a healthy milk, and not fit to keep her baby in health.

Is the partaking of fresh milk of tuberculous cows connected with great danger? As long as the bowels are in a normal condition, the danger is not great; for the acid contained in the stomach is not kindly borne by bacilli, and as long as the infant or child does not suffer from the remnants of former inflammations and ulcerations—I remind you, however, of the

many attacks of diarrhœa, summer complaint, etc.—the bacilli are merely swept through the intestines with the food remnants, and the danger of intestinal tuberculosis is passed. You may have heard, nevertheless, that doctors disagree in regard to the possibility or impossibility of transferring cow tuberculosis to man, and human tuberculosis to cattle. Nobody believes the question entirely settled, but it is an established fact that the bacilli of every disease, tuberculosis, diphtheria, cholera, or typhoid fever, are not always of equal violence, and that the differences of opinions and of results depend frequently on the difference in the poisonous qualities of such a bacillus, as is the subject of momentary experimentation. So we have to permit the doctors to disagree a little longer on an occasional point. There is one point, however, on which there should be no disagreement; which is this: The stomach and intestines of the newly born and the very young infant are not completed. Their epithelial layer is defective, and the younger the infant, the greater is the facility of microbic invasion even when they are perfectly well.

There are *many undoubted* cases of feeding milk from tuberculous cows that resulted in tuberculosis. My late friend, Olivier, of Paris, has the following report: Thirteen school girls in a Paris boarding-school were taken with tuberculosis. Six died. Some of them had the disease first in their bowels. The milk came from a tuberculous cow with a badly affected udder. John, a great veterinary anatomist, examined a cow that had the reputation of being the finest on a farm until she became emaciated and died. On account of her splendid condition her milk had been selected by the farmer for his own infant. The child died of tuberculosis at the age of two years and a half. A case like this proves, besides other things, the correctness of my teaching these more than forty years that it is always safer to select milk from a herd of cows than from a single cow and thereby to dilute possible dangers.

Second.—Expectoration is swallowed and carried down the intestinal tract. Infants and children never bring up the results of a cough. Bronchial catarrh, pneumonia, influenza,

croup membranes, tubercular expectoration, everything goes down; that is why in doubtful cases it often takes days even in a hospital to secure mucus or pus enough for a microscopic examination. As long as the mucous membranes of the abdominal contents are healthy, the poisonous substances pass through like remnants of food. When they meet a sore or ulcerous substance, the bacilli have their chance of settling down and making themselves, at least, comfortable. That happens more often in the young than in the old. For the young gut is more predisposed to absorption, its nets of blood-vessels being extremely complex and the lymphoids and ducts large and numerous. Do not forget in this connection, that the bowels of the young are frequently diseased. The large majority of diseases and deaths in the first year of life is still due to the alimentary canal; chronic congestion and ulceration persist often for a long period, and predispose to the deposits of infectious microbes.

What I told you about the frequency of tuberculosis of the peritoneum at that age should prove to you the greater tendency of the young gut to submit to tuberculosis than of the old. But we are always told, mainly by Koch and his followers, that the cases of tubercular infection thus caused are only rare indeed. Those who are stricken, however, though they be considered only exceptions, look at the question from their own point of view; if it were your case you could not be convinced that yours is no suffering for the reason that others escape. And, after all, the cases are not rare by any means; the vast majority of tubercular peritonitis is the result of intestinal invasion, and good observers, like Sill of London and Shennan of Edinburgh, assert that twenty-eight or twenty-nine per cent. of tuberculosis enters through the bowels. Heller published the reports of 714 autopsies, 140 of which were made on persons who had died of tuberculosis. Among these 140 there were 2 of the intestines and neighboring mesenteric glands, 33 of the mesenteric glands, and 10 more of mesenteric and other glands; altogether 53 out of 140. Hanse-  
mann wrote quite lately an elaborate paper to show that tuber-

culosis resulted very rarely indeed from feeding. His figures, however, are more conclusive than his reasoning. In the autopsies of 40 children who died of pulmonary consumption after swallowing all the expectoration, he found one with tuberculosis of the stomach, 16 of the intestines, which means that in nearly one-half of the cases the children had undoubtedly had their intestines affected by what they swallowed. Still, we cannot believe that milk from a tuberculous cow with a tuberculous udder is so poisonous as the contents of a consumptive lung which are swallowed, but this is only a matter of degree. It is possible that cattle tuberculosis may finally be proved, though belonging to the same class, to be less poisonous than human tuberculosis; it may be proved that the bacilli of milk, butter, and cheese are not endowed with great virulence; yet, after all, there are many proofs of actual and possible danger coming from tuberculous milk. The production, transportation, and consumption of milk is not merely an economic or agricultural problem, but a serious hygienic and sanitary question.

Let us consider a few of the localities which, by being kept in a healthy condition, may be prevented from becoming an inlet of tuberculosis.

A nasal catarrh in a child should be attended to. Though it last only a few days, the neighboring lymph-nodes, "glands," about the angle of the lower jaws begin to swell. What can you do for it? The customary oiling or greasing of the back of the nose? I think it does the mother more good than the baby. When there is much discharge, and obstruction of the nose, difficult respiration, an open mouth and a dry tongue, the nose should be gently irrigated with warm salt water at ninety or ninety-four degrees, one-half teaspoonful of salt to one-half pint of water, not from a dropper, nor from a spray, but from one of the many nasal glass cups in the market. Injection syringes should be used by very careful persons, or experts, only—for forcible injections may injure the ear. If you run a teaspoonful of the salt solution into each nostril, repeatedly, it will reappear on the opposite side, or in the throat.

Gagging and swallowing is not harmful. The procedure is so useful that numberless cases of glands around the neck that have lasted for weeks, will get well with this gentle process alone, without any medication. A nose kept clean will also be a protection against the deposit of bacilli and the growth of adenoids. For the normal soft lymphatic tissue which belongs to the posterior nares will grow when the neighboring circulation is impeded, will form adenoids, and may still be restored when relieved by washing. A similar effect is obtained by reducing the size of enlarged tonsils. They are frequently large at birth. Every new cold adds to their size and to their danger, which consists in the deposits of bacilli of all kinds and the absorption of their chemical poisons. I find very frequently, however, that the removal of enlarged tonsils and the scraping off of adenoids is not sufficient—or apparently ineffectual; if such cases are studied it will be found that there is a thickening and catarrhal condition of all the surrounding parts. The operation alone is not sufficient unless it is followed by a long-continued course of two or three daily irrigations as described.

The mucous membrane of the mouth is very apt to be injured; hot feeding, clumsy washing of the little mouth, a decaying tooth, the remnants of an inflammation, blistering or thrush which mothers justly fear, should be met with absolute cleanliness. No food should be allowed in the mouth after feeding; a few teaspoonfuls of water after a meal; early attendance on the teeth; in case of catarrh, the washing of the mouth with a teaspoonful of boracic acid in a cup of water.

Frequently the catarrh descends, or originates, in the wind-pipes or bronchial tubes. Within a few days of coughing and feverishness the glands in the chest begin to swell; they are very apt to become tuberculous; not to speak of the numerous cases of different forms of bronchitis and pneumonia which follow a common catarrh, particularly in sickly children. These things are frequently neglected; as the sick are only small, their sicknesses are deemed small to a ludicrous extent. Some thirty years ago a well-meaning man with a large family

said to me: "Doctor, you must now and then make a call. I do not mean to bother you much. When there are some such trifles as sick children, I shall not send but take the doctor around the corner; but you must promise to come and see us when we older people are sick." I said: "I shall make a bargain with you. I permit you to send for me when the children are sick. When you are sick yourself, just send for the doctor around the corner, or you may 'cry for Castoria.'"

As I said, there are a great many cases of inflammation whose development can be prevented; and a great many, like those in influenza, in whooping-cough, or in measles, which are very apt to become tubercular, and run off into pulmonary consumption. In all such cases, small or big, apparently trifling or dangerous, the ordinary person is beyond his depth. This is where a doctor comes in handy. I never knew the best one to be too good for a baby. In connection with this a warning may be timely. There are a great many diseases which run a regular course, and others in which the duration and course may be modified. Typhoid fever, scarlet fever, measles, belong to the first class; whooping-cough, to the latter. It has become a fashionably indolent habit to leave them alone. If you cannot cure them, however, you can modify and shorten them. Whooping-cough, it is true, will find its natural termination in three or four months or more, but often the child finds its natural termination before the three or four months are up. Every coughing spell, every day's illness, is a source of dangers. Some of these are convulsions, bronchitis, pneumonia, tuberculosis. They may occur during any day or week. If you had an opportunity to cut the disease short in five or six weeks, every secondary complication that occurs later is of your making, and every death is on your soul.

A few words on fresh air.

Theoretically everybody is convinced that the blood cannot be freely aërated, and the health must suffer unless the air we inhale is pure. The young organism suffers in this respect more than the old, for it requires more oxygen comparatively. It is impossible to go into particulars here, except to say that

unless a sufficient supply of oxygen is kept up and the percentage of carbonic acid stays below seven per mille, and unless direct injuries be kept out, health is incompatible with such faulty conditions. The changes in the air of our rooms which we have to fight constantly are as follows: It is too dry under the influence of our heating apparatus. Furnaces and most other heaters furnish a dry air which changes the surface of the mucous membranes in the nose, throat, and the lungs. There is no more voracious oxygen eater than the gas stove. Carbonoxid is the result of imperfect combustion, and a deadly poison; so are the chlorine gas, the nitric and sulphuric acids contained in our coal supply. They have even changed former health resorts, such as Denver, on account of the increase of factory chimneys, into questionable or dangerous localities. Add to this the dust of the houses and streets with all it contains, particles of stone, metals, vegetable remnants and microbes, and further the poisonous exhalations of the skin and intestines of men and animals, such as sulphides,—all of this locked up in small rooms inhabited by many old and young—thousands of these rooms in Greater New York have no windows,—calculate that the majority of our population live under such circumstances and surroundings, and you will no longer wonder why there are so many cases of catarrh, bronchitis, pneumonia, infectious fevers, and tuberculosis. You will rather be surprised that there are so many left with healthy organs, and also that public opinion has not progressed far enough either to treat the greedy enemies of a decent tenement-house law as criminals who should be the execration of mankind, or to send them to Bellevue for the examination of their mental condition.

Why do we send our tubercular patients to the country and see many of them getting well? Because there they have pure air and plenty of it. Only do not imagine that the name of a locality must have a magic influence. What happens to me very often is that a poor consumptive operative comes for advice. His doctor has told him that he is consumptive, and that unless he goes to Sullivan County, or to Colorado, at

once, he is sure to die. This brutal notice is frequently given to people who cannot scrape together the travelling expense. But if they could, what then? They would live in a small attic on poor food with no hope and nobody as a support. There is plenty of air, but none for them. They die the sooner.

The air in the country is pure, and is plenty, not because, as some joker said, the farmers keep the vitiated air within their own houses and rooms that are never opened, but because even in crowded country communities the cubic space obtainable to whomsoever can be on his feet, is interminable. That is why farmers who know how to cook and to eat, and particularly farmers' children, look ruddy and vigorous, while city people and their children are necessarily pale and anæmic and listless, and why diseases of the mucous membranes, finally leading to tuberculosis, are so frequent among our children when locked up in narrow city rooms.

A grave danger to adults and children, mainly the latter, are our bedrooms. Indeed, my friend Biermer, late professor in Zurich and Breslau, called tuberculosis a bedroom disease. With what right? A baby is at least sixteen hours a day in that narrow, confined, airless, windowless bedroom; a child at least ten or fourteen hours, the greater part of its young life. The air is the reverse of what it should be to protect blood formation, circulation, and digestion. What can be done to improve it to a certain extent? Some window should be open all night and day. If there be none in the bedroom, there is one in the adjoining front room or the kitchen at the rear. Unfortunately not always, for we are still in an era of the selfish refusal on the part of man to be held responsible for the evils and ills of his neighbors. We are hardly entitled to call ourselves a civilized community when fifty thousand families at least, with three or six children each, live each in one light room and one or two small dark holes. In these holes they breed tuberculosis. But it is no consolation to you that they die of it. Before they die they infect their neighbors; and their neighbors, in the capacities of seamstresses, servant girls, laundresses, cooks, teachers, infect you and your children and



your friends' children. It is not necessary to draw a lesson in just so many words.

Bedrooms want air, air, air. Half an inch—an inch of open space on the top of a window somewhere must be allowed. It must be open all night. That must become a habit never to be relinquished. It is one that goes along with a clean skin and as clean clothing as circumstances permit. An open window does not mean draught, which should be avoided. It can always be avoided, when the fresh air comes from one side only. When the window is too near the bed, or beds, let the immediate draught be provided against by a screen, or, when there is no screen, by a blanket or a sheet so fastened that it render the same service. Now and then you will hear the objection, that the little ones will uncover themselves during their sleep and thus be exposed. In hot air and a teeming atmosphere filled with improper gases they will uncover themselves, but when the air is cool, they keep covered. In connection with all these rules and advices, teachers could do a great deal, provided they give the matter any thought. There are too many who do not. Our perfectly overcrowded public and normal schools are always too hot. Windows are opened indiscriminately. Children sitting under them are directly exposed. Thousands of New York cases of catarrh, bronchitis, pneumonia, and tuberculosis could be avoided, if a little knowledge—that is all that is required—were combined with a fair amount of common sense. I say a little knowledge; I am firmly convinced that the rules that teachers should be directed to communicate to their flock can be printed on eight or ten pages, or less.

The general rules for the prevention of tuberculosis are valid for the young as they are for the old. There must be no spitting on the floor, nor in handkerchiefs and towels. Food and drink should be boiled. Food should be simple and nutritious; milk and cereals should be or are cheap. Indiscriminate kissing should be stopped.

A few additional warnings for teachers might be as follows:  
Halls should be nearly as warm as the schoolrooms.

Children should not be in the rooms during a recess.

Recesses should be longer than they are; the younger the children, the longer should recesses be between lessons.

Vacations should be longer. The second Monday in September is part of our hot season.

There must be no dusting in the presence of children; in fact the cleaning of the floors should be no dry brooming. No child should ever be expected to help in it.

This is not for school buildings only; but for apartment and tenement houses. There is no greater danger to the community than the carpets in thousands of tenement houses that are never cleaned and harbor the bacilli of tuberculosis and typhoid and diphtheria that have accumulated for years and, as no light ever strikes them, remain alive indefinitely.

APPENDIX 9

THE CLIMATIC AND SANATORIUM  
TREATMENT OF CONSUMPTION

By HENRY P. LOOMIS, M.D.



## THE CLIMATIC AND SANATORIUM TREATMENT OF CONSUMPTION

THERE is no problem of more absorbing interest to-day to physicians from a medical and humanitarian aspect or to the public from a social and economic standpoint, than the comprehensive management or care of people suffering from consumption. Any consideration bearing directly on this question should be inspired solely by its relation to two central thoughts: the welfare of the consumptive class and the permanent protection of the community. The welfare of the consumptive, especially among the poorer classes, necessitates intelligent aid rendered to those in the earlier stages of the disease, thus affording a reasonable prospect of successful cure. The interest of the community is in the prevention of the spread of the disease from the sick to the well,—this to be along the lines of some well-directed and far-reaching system of education of the masses as to right methods of living, the dangers of contagion, and the importance of recognizing and treating the first evidences of the disease.

The Charity Organization Society, through its Committee on Tuberculosis, is effectively working along these lines. The interest of the community also demands the removal from its very midst of destitute invalids who constitute not only a personal burden to the family but a menace to society through their ignorance and inability to observe certain well-known precautions against spreading the malady.

This latter problem must be solved by municipal and state aid. I have seen in the last twenty years innumerable new methods of treatment and cures for this disease hold for a time the attention of the medical profession and the people, but they have all disappeared, and the only method to-day which has stood the test of time and which is recognized all over the world as promising the best results, is what is known as the climatic treatment of consumption, that is, the living in a suitable climate and breathing pure air.

I can almost positively affirm that if any one of you here to-night should develop consumption you would make every sacrifice to leave New York and go and live in a suitable climate. I notice that the medical profession to a man when they become infected with the disease follow this plan. To illustrate this, I found on investigation that of the forty physicians in Denver, thirty per cent had consumption when they went to Colorado. Climate, then, is the only curative agent which has stood the test of time. To the wealthy the change to suitable surroundings is an easy matter. To those in moderate circumstances it is often a burden. To the poor it is generally impossible. To this last class aid must be given. While climate far outweighs all other methods of treating this disease it is expensive. It is often said that the prognosis of consumption depends upon the purse of the patient. This is true only to a certain extent.

#### CLIMATE

As the seeds of consumption come from the air we breathe, so in a great measure its cure is effected through the same channel. I do not believe with some that there is any specific climate for consumptives, nor do I believe with others that any climate is good provided the air is pure and uncontaminated. While climate is not a specific it far outweighs all other aids we have in the treatment of this disease. We all know what a tonic effect a change of climate and surrounding has on us when we become run down or tired out. We cannot say just

what this effect is due to, but we know that we eat better, sleep better, and more quickly regain our normal health than by any other means. This same tonic effect on the general system of the consumptive is apparent, and much more so than in one suffering from any other disease. Climate, then, holds the first place as an improver of nutrition; besides, the pure air breathed in has a distinct and beneficial effect on the inflamed and diseased lung, so we have both a general and a local effect, so to speak. It has been found that the more fresh and bracing air consumptives can breathe the more they improve; they are advised, therefore, to remain out of doors as much as possible—eight, ten, twelve hours, to sleep with their windows open, and so practically to breathe the pure air of any particular locality for the whole twenty-four hours. I may say that the best climate for a consumptive is the one that will permit him to remain out-doors more and longer at a time than anywhere else; as in health not all climates suit every individual, so the consumptive is found to present personal idiosyncrasies; but it is a safe rule to go by—to remember that the kind of climate in which the person always felt the best before he contracted consumption will most probably be the kind of climate that will agree with him after he has contracted this disease. As sunshine is the greatest foe the consumption germ can encounter, and direct sunlight will quickly destroy the most virulent tubercle bacilli, so that climate which has the greater number of clear, sunny days is the climate in which most consumptives do the best. This is one of the great reasons why our northern winters and springs are so bad for consumptives,—this and the sudden changes of temperature which are of such constant occurrence. Places, no matter how favorably situated as to general climatic conditions, may from some local cause, such as the too close proximity of high mountains, liability to high winds, or sudden changes of temperature, be rendered unfavorable for consumptives. At one time it was thought consumptives could hardly stand a cold climate, and I can remember how twenty years ago they were sent to our Southern climates, such as Florida, especially to escape the cold. This has all

changed now—and it is a well-known fact, which has been emphasized by Dr. Trudeau in his experience in the Adirondacks, where the temperature for much of the time is below zero, that consumptives always do better in the winter than in the summer. Experience has proven that the majority of people living in low altitudes, or sea-port cities, when they contract consumption, improve more rapidly if they make a change of climate to inland, and to elevated regions. Altitude, I believe, is a very important element in the climate for a consumptive. It is not necessarily the high altitude of five thousand feet of Colorado, but in my experience most cases do better at an elevation of above twelve hundred feet. I know there are some exceptions, such as when the disease develops in those advanced in years, in those of unusual nervous temperament, or people in advanced stages of the disease. Another element of climate which experience has proven is important, is dryness. So important do some of the English physicians consider this that they are now sending their patients to a health resort recently established in the desert about ten miles from Cairo. Here it is so dry that meat exposed to the air never spoils.

Wherever we find this combination we may rest assured that consumptives will do well, and if not in a too far advanced stage of the disease, will recover. We are fortunate in having in America the finest and best climate the earth affords—where also may be found the comforts of life which are so essential in cases at all advanced.

From what I have just said you readily perceive that there are three elements of climate which are to-day most generally believed to be essential for people with consumption.

1. *Sunshine*: *The maximum amount of clear days with sunshine.*—The conditions of high and dry climate are best met in our country on the elevated plateaux of Colorado, New Mexico, and Arizona, and at such places as Denver, Colorado Springs, El Paso, Las Vegas, Albuquerque, New Mexico, and Phoenix in Arizona. The conditions of moderate elevation and pure atmosphere we find in Asheville, North Carolina, the Adi-



rondack Mountains, and at Sullivan County in our own state, while the soft and soothing influence of a pure and balmy atmosphere is provided in lower California, in Aiken, and in Thomasville, Georgia, and at Nassau. It has been found that strong individuals in the first early stages of consumption do exceedingly well in a colder climate, while advanced and feeble persons improve in balmy and low-altitude situations.

2. *Altitude*.—We all know that as we ascend there is a marked reduction in the pressure of the atmosphere. This is so much so in very high altitudes that it is almost impossible to breathe. In high-altitude health resorts, on account of this diminution of pressure, greater work is put upon the heart and lungs so that by the process of rapid heart and lung action increased nutrition is brought to the diseased lung. Purity of air really means air free from germs. It has been proven that ten cubic meters of air in New York contain, on an average, fifty-five thousand germs. It has also been shown that germs steadily diminish as the altitude increases, and at an elevation of thirteen thousand feet they are no longer found in any portion of the globe. The danger of inhaling ordinary germs is that a mixed infection may occur, by which is meant that the changes in the lungs caused by the tubercle bacillus, the germ of consumption, may be rendered much more active by the entrance of other germs.

3. *Dryness*.—Dryness in the air is also an important factor in climate. It has been proven by experiments that the consumption germ multiplies very rapidly under moisture, and the inhaling of moist air seems to have the effect of stimulating their activity in the lungs.

It will be readily seen by any one who visits open health resorts where a number of consumptives are collected together, why many of them do not improve. The climate may be ideal, and the invalids may be having the most nutritious food, and still the general life they lead does away with all the climatic advantages. Late hours, excess in eating and drinking, staying in closed and badly ventilated parlors in the

evening, neutralize any beneficial effects, and the patient most probably leaves, blaming the climate for the lack of improvement, when the result is due entirely to the fault of his manner of living. I have known many a young fellow with only a slight trouble in his lungs to die in the Adirondacks, more from the effects of whiskey than from the disease itself. It is difficult for many people to adapt themselves to a methodical plan of life long enough to establish a permanent cure in consumption. Personality has long been a main factor in determining the prognosis.

#### SANATORIUM TREATMENT OF CONSUMPTION

During the last five or ten years a new method of treating consumption has taken hold of the medical profession of this country and, to a certain extent, of the people—namely, the entrance into and continued residence in sanatoriums especially established and equipped in suitable localities for the treatment of this disease. This plan of treatment has been in vogue in Europe and especially in Germany for nearly thirty years, but it is only in recent years that the Americans have adopted the method; and even now wealthy Americans do not take kindly to the restraints and discipline necessary in the conducting of these institutions. In Germany all classes, when they become consumptive, the prince and the pauper, enter one of the innumerable institutions. It is a well-known fact that the comparison between patients in the sanatoriums situated in favorable climates and patients in hotels and boarding houses in the same region, shows that the increase in the number of cures is almost two to one in favor of the sanatorium, and when I explain to you how these sanatoriums are conducted you will readily see why this is so. Consumption is a disease with periods of quiescence and periods of exacerbation. During one of these periods of exacerbation, which are generally accompanied by fever, increase of cough, and expectoration and night-sweats, due, as the patient generally thinks, “to catching cold,” but really to overexertion, disturbance of digestion,

and nervous excitement, the disease makes inroads, and finally, after one of these acute attacks, the patient recovers, but hardly ever with the same condition of the lungs as before, more of the lungs having been destroyed. After a longer or shorter period of apparently good health, another acute attack develops, and so on. Now the constant observation under which the patient is kept by the trained medical men in these sanatoriums enables them to detect the least variance in the patient's general condition, such as slight fever, often so slight as to be imperceptible to the patient, and it is attended to before any headway is made. It is the constant daily care and close observation of the sick consumptive and the attention bestowed on his manner of living that turns the balance in favor of the sanatorium patient.

A word as to how sanatoriums came to be established for the treatment of consumption.

In 1859, Dr. Brehmer of Görbersdorf, Germany, having had his attention called to the teachings of an obscure country practitioner, Dr. George Bodington, living at Sutton, Manchester, England, as to the value of pure air and out-of-door life in the treatment of this disease, was led to establish the first sanatorium, where the suggestions of Dr. Bodington were carried out. From that day the idea of sanatoriums has steadily gained ground. They are now in every portion of the world, and to-day in Germany alone there exist thirty-three popular institutions, many of them established by the state, others by the Government insurance companies, and still others by philanthropists, and some as good investments for capital. German insurance companies invested last year over one million dollars in sanatoriums for consumptives, and expended nearly another million in maintaining these institutions.

England has been for a long time far ahead of this country in possessing several institutions for the treatment of consumption, as it is well claimed that of the reduction in the death-rate from consumption during the last thirty years in England, nearly one-half is directly traceable to the general doctrine of

the sanatorium plan of treatment. What do we mean by a modern consumption sanatorium? It is an institution devoted to the treatment of consumption, situated in a healthy locality free from dust and dampness, and generally at some elevation. The greatest care is exercised in the buildings and in the surroundings to avoid the possible transmission of the disease to employees or neighbors of the institution, and equal care is exercised to prevent the re-infection of the patients themselves. The cardinal rule, which is enforced in all these institutions, is daily observed as to the expectoration from the patients, and the insistence that patients should only spit into certain prepared receptacles. In the United States at the present time there are three kinds of consumption sanatoriums:

First. Those that have been built and supported entirely or in part by funds furnished by the various state treasuries. It is only a few years ago that the first sanatorium was erected by the state of Massachusetts, at Rutland. Recently, other states, New York, New Jersey, Iowa, Maine, and Illinois, have taken steps in this direction, and I believe that within ten years every state in the Union will have its own consumption sanatoriums.

Second. Sanatoriums which have been built and equipped by philanthropic people to give climatic advantages to those who are unable to pay the excessive charges of boarding-houses and hotels in well-known health resorts. Generally the rate of \$5 per week per patient is charged. It is impossible in most of these institutions to care for the patients satisfactorily for less than \$8 or \$10 per patient per week, and so the difference per patient between charge and cost must be made up by contributions from philanthropic people.

Third. Sanatoriums charging from \$15 to \$25 per week. At this rate institutions ought to be self-supporting. We have at the present day in this country sanatoriums for the well-to-do, sanatoriums for those in very moderate circumstances, but no sanatoriums for that large class of consump-

tives who are unable to pay anything. Possibly, when a large enough state sanatorium has been built, accommodations can be furnished for this class of people, but I question whether enough can be accommodated to do very much good. What is needed is just what has already been done in Germany with wonderful success: namely, each city of any size should establish its own sanatorium and look after its own consumptive poor. It has been estimated that the amount of money that could be saved to New York State, allowing a six-months' residence in the sanatorium and the return of the patient to his occupation as wage-earner, as would occur in the majority of cases, would be a saving of over a million dollars per year.

To illustrate how the sanatoriums are enabled to accomplish the rapid cures which are effected in most of them, I shall describe the daily life of the patient who has entered one of the large German sanatoriums with the disease fairly well advanced.

The object of all sanatorium treatment is to have the patients spend the greatest number of hours in the open air, and it is found that the majority improve more rapidly, especially during the early stages of their stay, by rest rather than by exercise. Improving the general nutrition of the patients is also another object, and this is accomplished by giving them as much to eat as they can assimilate. With these two objects in view the following is the daily régime:

At eight o'clock in the morning a domestic enters the bedroom of the patient and closes the windows, which have remained open all night. He lights a fire and serves the first breakfast. After this the patient arises and is comfortably arranged in a long chair something like a steamer chair, out of doors, generally on a protected porch. His legs and body are warmly covered and often a hot-water bottle, if the weather is cold, is placed at his feet.

About eleven o'clock concentrated nourishment is brought to the patient: a glass of milk, some egg-nog, or bouillon. At twelve there is dinner, after which the patient enjoys a

promenade, which varies according to the prescription of the physician. The promenade is made on a terrace or in a winter garden connected with it. Afterward the patient resumes his place in the reclining-chair and passes the whole afternoon in a state of absolute repose. A quiet game of cards, dominoes, conversation, or reading is not forbidden. Certain patients indulge in profound sleep, and care should be taken that this in no way interferes with the sleep of the night. Often at four o'clock nourishment is brought to the patient. After this dinner is served, and after dinner another promenade shorter than that in the afternoon. The person then returns to the reclining-chair and remains there until ten o'clock in the evening, and then retires and sleeps in a flannel gown. The windows should be open all night. As patients improve they are allowed to take more exercise and prolong the promenade. In sanatoriums in this country such a rigid régime is not usually enforced unless the patient has fever. It is a plan in the best sanatoriums with which I am acquainted to keep the patients absolutely in bed if they are having a high fever. In some of the sanatoriums the beds are arranged on tracks, a plan which enables them to be wheeled out on the porch so that the patients can lie in the open air.

#### CONSTRUCTION OF THE SANATORIUMS

There is a good deal of difference in the construction of the sanatoriums in Germany, England, and this country. The European sanatoriums almost always consist of a central building, which has a dining-room and administration offices, and wings leading out from either side in which are the bedrooms. Along the front of the sanatoriums are broad piazzas. In this country the plan has been to build a large number of small, detached cottages, accommodating each from four to eight patients, grouped about the central building. On this plan has been built the Adirondack Cottage Sanitarium and the sanatorium at Liberty, Sullivan County. The advantages are that the patients are not brought in such close contact with

one another, the surroundings are much more agreeable, and to a certain extent the amount of fresh air obtained is greater, and this advantage has caused the great increase in the building of institutions on these plans. The extra heating alone is a very great item of expense, as the amount of accommodation in sanatoriums of the first and second class is limited; and as their object is to do the greatest good to the greatest number, it is very important that only those cases should be admitted who it is believed can be cured and sent back to their work in the shortest space of time. From experience of a number of years in examining a very large number of cases for the Adirondack sanatorium and for the one at Liberty, I am fully convinced that six months is the average time that is required to bring about so complete a cure that the patient can return to his former life with safety. I have seen a number of cases accomplish this in three months, but they are exceptions. I believe all cases should be admitted to state and philanthropic sanatoriums on probation, and, if they do not show a marked improvement at the end of the month, should make way for others more fortunate. The object of this careful selection can be readily seen: as each bed can accommodate only two, or possibly three, patients during the year, it would take a large sanatorium to show permanent results in even a thousand individuals.

There is a class of sanatoriums in Europe, and especially in France, which have given the most wonderful results. I refer to what are known as the sea-coast sanatoriums for scrofulous and tuberculous children. The statistics in Germany alone show that fifty per cent of these little ones leave these institutions perfectly cured. We have none in this country, and we say it to our shame. Right here is an opportunity for some philanthropically disposed person. The results from climatic treatment of tuberculosis in children far exceed those in the adult.

To believe that consumption is a curable disease one has but to consult the statistics furnished by the large sanatoriums. From any institutions which only receive patients in the very

early stages of the disease, seventy to seventy-five per cent are discharged cured. In most of the sanatoriums of Europe, where people in all stages are taken, statistics show that twenty-five per cent are absolutely cured, and fifty per cent leave much improved, and many of them capable of earning their living. The question is often raised if these cases discharged cured remain cured. Dr. Trudeau of the Adirondack Cottage Sanitarium, which has been in existence for about fifteen years, is in constant communication with 115 patients who have been discharged, and while a few have relapsed slightly the majority of them are well and living in their own homes. If people would remember these statistics they would not question the curability of phthisis, but know that the ratio of cure is in proportion to the time in the disease when the climatic treatment is commenced. If the consumptive could be impressed with the fact that he might lose in one week by continuing his daily occupation what would take him two months to regain under the best climatic advantages, there would be less procrastination in people who could well afford to make the change. If I were asked to what is due the success of the sanatorium treatment of consumption at the present day, I should say it was owing to the thorough and constant supervision of the consumptive, the immediate intervention when new symptoms manifest themselves or when old ones become aggravated and do not disappear readily enough, proper food and drink, and the personal education which the patient receives from the trained physicians who are devoting their time to his care. Not the most beautiful and healthful climate nor the most delightful resort can cure the consumptive patient, if he is not wisely guided in treatment. All that the patient will have learned from the sanatorium rules and regulations and the daily advice of the physician is how to protect himself and others from contracting the disease; how not to take cold, and how not to lose what he has gained during precious hours of persistent effort.

Certain signs of the time point to the fact that this great city of New York will in the near future take care of its consump-



tive poor—what it should have done long ago. It is far behind its sister cities in Europe. It will not do this from philanthropic motives but will be forced to it as a municipal expedient to protect its citizens from the infection of the thirty thousand consumptives who are walking its streets to-day.



APPENDIX 10

TUBERCULOSIS AND ITS PREVENTION

By T. MITCHELL PRUDDEN, M.D.

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## TUBERCULOSIS AND ITS PREVENTION

IT is commonly neither wise nor necessary for people not professionally concerned to think much about disease, or weigh anxiously the chance or mode of its acquirement. But now and then conditions arise which demand general attention and instruction regarding certain diseases in order that a great threatened or actual calamity may be averted. Such a condition faces the people in all lands to-day in the appalling prevalence of tuberculosis. A disease which in mild or severe form affects at least one-half of the whole human race, and which causes the death of full one-seventh of all who pass away, killing about one-third of those who perish between the ages of fifteen and forty-five,—a disease which is most insidious in its onset, and often relentless in its course, and which may be largely prevented,—is one about which we cannot be indifferent, and should not longer be inactive.

For a long time there has been reason for believing that tuberculosis is a communicable disease. Its prevalence in certain families and communities, its frequent occurrence in those who have personally attended upon its victims, its onset in those who have occupied apartments vacated by consumptives—such facts observed over and over again abundantly justify the belief in its communicability.

Until a few years ago the cause of tuberculosis was unknown, and no definite data were at hand which could help us to make a feasible plan for limiting its ravages. But in these later years a great light has been thrown upon this and other kindred diseases.

Most intelligent people are aware that within the past two

decades a new field in the domain of life has been opened and widely explored. It has been learned that in earth and air and water there exist countless myriads of living things so minute as to lie far beyond the limits of the unaided vision, and yet in the aggregate so potent in the maintenance of the cycle of life upon the earth that without their activities all life would soon cease to be, and the elements which for a short span fall under the sway of the life forces in all higher animals and plants would lapse finally and irrevocably into their primal state. These tiny organisms are called germs, microbes, or micro-organisms. One great and important group of them belongs among the microscopic plants called bacteria.

These bacteria as a class are so important in the economy of nature because they live for the most part on dead organic material—that is, such material as has once formed a portion of some living thing. Now the world's store of available oxygen, hydrogen, carbon, and nitrogen, out of which all living beings are largely formed, is limited, and if after these have served their temporary uses, as the medium through which that mysterious potency called life alone can find expression, they were not speedily released, new generations of living beings could neither assume nor maintain their place in the great cycle of life. And so these tiny plants, year in, year out, by day and by night, unseen and mostly unheeded, are busy always in making possible the return of each year's visible vegetation and the maintenance of an unbroken succession of generations in man and beast.

Different groups and races among the bacteria have different habitations, and vary widely in their special powers. Complex and powerful as is the aggregate result which they accomplish in the world, the performances of the individual are comparatively simple. They are most liberally endowed with the capacity for multiplication, and each germ acts as a tiny chemical laboratory, taking into itself the organic matter on which it feeds, and resolving it into new compounds. Some of the latter are used in building up and maintaining its own body, while others are given off into the surrounding media.

We are but just beginning to peer in at the mysterious processes which go on under the influence of the bacteria in this underworld of life, and to realize that all the lore which unwearied toilers in the past have gathered in their studies of the visible forms of animals and plants makes but one of the many chapters in nature's story-book of life.

But this new and stimulating point of view, toward which the studies of the past decades have led us, does not look so largely into the domain of the practical that it would greatly attract the majority of business- and pleasure- and ennui-ridden mankind were it not for one very significant fact which these recent studies have revealed. This is that among the myriads of altogether beneficent bacteria which people the earth and air and water there are a few forms which have chosen out of all the world as their most congenial residence the bodies of men. But even this would be of only passing interest to most people were it not still further unfortunately true that in the performance of their simple life-processes these man-loving bacteria, feeding on the tissues of their host, and setting free certain subtle poisons in his blood, each after its kind, can induce those disturbances of the body's functions and those changes in its structure which we call disease.

The diseases caused by the growth of germs in the body are called infectious. The germs causing some of the infectious diseases are given off from the bodies of their victims in such form as to be readily transmitted through the air to others, in whom they may incite similar disease. Such diseases are spoken of as readily communicable, though it is not actually the disease itself, but only the germ causing it which is transmitted. In other infectious diseases transmission but rarely occurs. Many infectious diseases are very easily communicated from the sick to the well under unsanitary and uncleanly conditions, which with proper care are very little liable to spread.

I need not here put on parade the whole uncanny list of germ diseases, in which tuberculosis stands foremost, followed by pneumonia, diphtheria, typhoid fever, and the rest. Nor

need I call to mind the means by which our growing knowledge in this domain has day by day been laid under tribute for suggestions of hope and safety for the stricken. It is a record of brilliant conquest in nature, and already of far-reaching beneficence to man.

But the great fundamental advance which signalizes the past decade is the lifting of this whole class of fateful germ diseases out of the region of the intangible and mysterious, and their establishment, on the basis of positive experimental research, in the domain of the comprehensible and definite. The things which cause them are no longer for us mysterious emanations from the sick, or incorporate expressions of malign forces against which conjurations or prayers could alone promise protection. But they are particulate beings, never self-engendered, never evolved in the body, always entering from without—things which we can see and handle and kill.

Let us now glance at the germ called the tubercle bacillus, the germ which causes and which alone can cause tuberculosis. It does not exist in the body of men or animals in health. Without the entrance of this particular germ into the human body from without, tuberculosis cannot develop in it. Without the transmission of this germ in some way or other in a living condition from the sick to the well, tuberculosis cannot spread. In the life story of this tiny germ lie both the potency for mischief which we deplore and the secret of our release from its bondage.

The tubercle bacillus is a little colorless rod-like plant, so small that even many thousands of them piled together would make a heap still far too small to be visible to the naked eye. It cannot move about, nor can it grow without moisture, nor at a temperature much above or much below that of the human body. The material on which it feeds must be very nicely adapted to its requirements, and it has no lurking or growing places in nature outside of the bodies of men and a few warm-blooded animals. It can be cultivated artificially in the laboratory, and we know more about its life and peculiarities than about almost any other germ. While it can remain alive in a



dried state for many weeks, it is readily killed by heat, by sunlight, and by many of those chemical substances which we call disinfectants. It does not flourish equally well in the bodies of all human beings.

When once it gains lodgment in a body suited to its growth it multiplies slowly, each germ dividing and subdividing, taking from the tissues material for its growth, and returning to them certain subtle poisons which it sets free. The action of the tubercle bacillus is peculiar in that it stimulates the cells of the body, wherever it may lodge and grow, to the formation of little masses of new tissue, which we call tubercles. These tubercles are, as a rule, short-lived, and, if the disease progresses, tend to disintegrate. If the tubercles have grown in such situations as make this possible, as in the intestinal canal or the lungs, the disintegrated and broken-down material, often containing myriads of the living germs, may be cast off from the body. In tuberculosis of the lungs, or consumption, this waste material is thrown off with the sputum. While almost any part of the body may be affected, tuberculosis of the lungs is by far the most common form of the disease.

It follows from what has been said that the only way in which we can acquire tuberculosis is by getting into our bodies tubercle bacilli from tuberculous men or animals. The only animals liable to convey the disease to man are tuberculous cattle, and these through the use of either meat or milk. The danger from the use of uncooked meat or the unboiled milk from tuberculous cattle is real and serious, but it will not be considered here at length, because the great and prevailing danger of infection comes from another source.

Almost as soon as the significance of the tubercle bacillus was established, a series of studies was undertaken on the possibility of the spread of the disease by the breath or exhalations of the persons of consumptives. These studies at once showed that the tubercle bacillus cannot be given off into the air of the breath from the moist surfaces of the mouth and air passages, nor from any material which may come from them while it remains moist, nor from healthy unsoiled surfaces of

the body. The establishment of this fact is of far-reaching consequence, because it shows that neither the person nor the breath of the consumptive is a direct source of danger even to his most constant and intimate attendants.

While the discharges from the bowels in persons suffering from tuberculosis of the intestinal tract may contain many living bacilli, the usual mode of disposal of these discharges protects us from any considerable danger from this source.

It is the sputum after its discharge from the body on which our attention must be fixed. While the sputum is moist it can, as a rule, do no harm, unless it should be directly transmitted to those who are well by violent coughing, or sneezing, by the use of uncleansed cooking or eating utensils, by soiled hands, or by such intimate personal contact as kissing or fondling. But if in any way the sputum becomes dried, on floors or walls or bedding, on handkerchiefs or towels, or on the person of the patient, it may soon become disseminated in the air as dust, and can then be breathed into the lungs of exposed persons. This germ-laden material floating in the air may be swallowed, and thus enter the recesses of the body through other portals than the lungs, but these are the most vulnerable and accessible organs.

The wide distribution of tubercle bacilli in the air of living-rooms, and in other dusty places where people go, is due partly to the frequency of the disease, and the large numbers of living bacilli which are cast off in the sputum (sometimes millions in a day), and partly to the fact that many of the victims of consumption go about among their fellows for purposes of business or pleasure for months or years. So each consumptive, if not intelligently careful, may year after year be to his fellow-men a source of active and serious and continual infection.

This, then,—the dried uncared-for sputum of those suffering from pulmonary tuberculosis,—is the great source of danger; this the means so long concealed by which a large part of the human race prematurely perishes. Let but this discharged material be rendered harmless or destroyed in all cases before it dries, and the ravages of this scourge would largely cease.

This is not a theoretic matter only, for again and again have the living and virulent germs been found clinging to the walls and furniture and bedding and handkerchiefs of consumptive persons, and in the dust of the rooms in which they dwell.

A malady whose victims far outnumber those of all other infectious diseases put together, sparing neither rich nor poor, seizing upon life while it is as yet only a promise, but most inexorable in the fulness of its tide—this malady can be largely prevented by the universal and persistent practice of intelligent cleanliness.

We have learned in the past few years one fact about tuberculosis which is of incalculable comfort to many, and that is that the disease is not hereditary. It is very important that we should understand this, because it seems to contradict a long-prevalent tradition, and a belief still widely and sorrowfully entertained. Bacteria, and especially most disease-producing bacteria, are very sensitive in the matter of growth and proliferation to the conditions under which they are placed, and especially to the material on which they feed. So that a germ which can induce serious disease in one species of animal is harmless in the body of a different though closely allied form. More than this, different individuals of the same species, or the same individual at different times, may have the most marked differences in susceptibility in the presence of disease-producing germs. What this subtle difference is we do not know. Whether the body at one time affords a congenial soil to the invading germs and at another does not; whether its marvellous and complex powers of resisting the virulent tendencies of disease-producing bacteria at one period or in one individual are more vigorous than in another and vary at different times, we do not certainly know. This, however, we do know, that certain individuals are more likely than others to yield to the incursions of the tubercle bacillus. This vulnerability in the presence of invading germs we call susceptibility, and susceptibility to the action of the tubercle bacillus is hereditary.

It is not the disease, tuberculosis, which comes into the

world with certain individuals or with successive children of the same family, but the aptitude to contract it should external conditions favor.

However much the child of tuberculous parents or a member of a tuberculous family may be predisposed to the disease, he cannot acquire tuberculosis unless by some mischance the fatal germ enters his body from without. What has been regarded through all these years as the strongest proof of the hereditary transmission of tuberculosis—namely, the occurrence of the disease in several members of the same household—is, in the new light, simply the result of household infection—the breathing of air peculiarly liable to contain the noxious germs, or their entrance in some other way into the bodies of persons especially sensitive to their presence.

I do not mean to imply that under no conditions can the tubercle bacillus be transmitted from the mother to the child before its birth. In a few instances this is believed to have happened. But its occurrence is so extremely infrequent that it may be regarded as accidental, and of no serious importance from our present point of view.

But it will perhaps be said: “If the tubercle bacilli are so widely diffused, why do we not all acquire tuberculosis, and why was the world not long since depopulated?” In order to explain this matter I must ask the reader to look with me for a moment at some of the body’s natural safeguards against bacterial and other invaders from the air.

It has been found that a person breathing in germ- and dust-laden air through the nose breathes out again air which is both dust- and germ-free. The air passages of the nose are tortuous, and lined with a moist membrane, against which the air impinges in its passage. On these moist surfaces most of the solid suspended particles, the germs among them, are caught and held fast, and may be thrown off again in the secretion. In breathing through the mouth this safeguard is not utilized. Again, the upper air passages leading to the lungs are lined with a delicate membrane of cells, whose free surfaces are thickly beset with tiny hairlike projections. These pro-

jections are constantly moving back and forth with a quick sweep, in such a way that they carry small particles which may have escaped the barriers above, up into the mouth, from which they may be readily discharged. In this way much of the evil of breathing dust- and germ-laden air is averted. But in spite of these natural safeguards a great deal of foreign material, under the ordinary conditions of life in-doors or in dusty places, does find lodgment in the delicate recesses of the lungs. The body tolerates a good deal of the deleterious material, but its overtasked toleration fails at last, when serious disease may ensue.

When ordinary forms of living bacteria get into the tissues of the body, a very complex cellular mechanism, not fully understood, usually leads to their destruction and ultimate removal. In the presence of the tubercle bacillus the body cells are often able to build a dense enclosing wall around the affected region, shutting it off from the rest of the body. This is one of the modes of natural cure.

The body cells are sometimes able, if sustained by nourishing food and an abundance of fresh air, to carry on, year after year, a successful struggle with the invading germs, so that the usefulness and enjoyment of life are but little interfered with. Finally, a certain proportion of human beings seem to be endowed at birth with some as yet unknown quality in the cells or fluids of the body which naturally unfits them for the life uses of the tubercle bacillus, and so renders the individual for longer or shorter periods practically immune. Others, on the contrary, are, as we have seen, from birth unusually susceptible.

This inherited susceptibility to the incursions of the tubercle bacillus, should this find lodgment in the body from without, by no means always reveals itself in any apparent lack of vigor or robustness of the body. Still, any habit or mode of life which diminishes the bodily vigor, whether in those predisposed to this malady or in the apparently immune, and gives it a leaning toward disease, diminishes, as a rule, the chances of a successful contest with the bacillus.

Thus it is that in spite of the wide distribution of these fatal germs in frequented places, and the tendency of certain vulnerable persons to succumb to their ravages, so many people are not affected by them, and so many, although not altogether escaping their malign influence, are yet able to wrest at least a moiety of life from the hands of the great destroyer.

The degree of success which may attend our crusade against tuberculosis will largely depend upon the wide diffusion of the knowledge of its communicability by means of the sputum, dried and powdered and floating in the air as dust, and the intelligent persistence with which the peccant material may be safely cared for at its sources.

The resolute avoidance by consumptives of the not only filthy but dangerous practice of spitting upon floors or streets, or anywhere else except into proper receptacles; the use of receptacles which may be and are frequently and thoroughly cleaned, and, best of all, of water-proof paper cups, which with their contents may be burned; or, when circumstances require, the receiving of the dangerous material on cloths or Japanese paper napkins, which may be destroyed by fire, and not on more valuable handkerchiefs on which the sputum is allowed to dry while in use or before disinfection and washing; scrupulous care by others of the sputum of those too ill to care for it themselves—these are the comparatively simple means from which we may most confidently expect relief. The details of these precautions and their adaptation to the special circumstances of those suffering from tuberculosis can most wisely be left to the physician, and, though of paramount importance, need not further engage our attention here.

To the consumptive himself these measures are not without a vital significance. For his chances of recovery may be diminished in no small degree if he be more or less constantly liable to a fresh infection from material which he has once got rid of, and which should have been destroyed.

The great volumes of fresh moving air which we encounter out-of-doors in properly cleansed streets usually so greatly dilute the dust, of whatever kind, that little apprehension need

be felt from its presence. When, however, in crowded cities, the streets are filthy, and but fitfully cared for; when choking dust clouds must be encountered by the citizen in the haphazard and slatternly essays at cleaning which untrained, irresponsible, or decrepit attaches of vicious administrations may deign to make—we cannot ignore a danger from street dust which may well incite the gravest apprehension. The citizen can, if he must, avoid a block on which the hand-sweepers, in utter disregard of rules, ply their nefarious brooms over unwet surfaces, because too indolent or indifferent to sprinkle them—this he can do if he be not willing or ready to apply the citizen's remedy for municipal misrule.

But it is in rooms either of dwelling or assembling places that the ill effects of infectious dust are most potent, because the air is here not so constantly renewed as it is out-of-doors, and is liable to be breathed over and over again. Dust which gets into houses does not readily leave them, unless special and intelligent means be directed to its removal. We do not usually realize that though the air itself in inhabited rooms is constantly changing more or less rapidly by diffusion, by draughts, or by purposed ventilation, fine dust particles are not removed under the same influences in proportionate degree. They cling more or less tenaciously to all surfaces on which they have settled, and especially to fabrics, so that currents of abundant force and sufficient distribution to change the air may and usually do leave the lodged dust particles almost entirely undisturbed.

One of the most threatening tendencies of modern times in matters of health is to overcrowding in cities. The great element of danger from this overcrowding is not only the insufficiency of air in living-rooms, and the lack of ready means for its renewal, but the accumulation in this air of infectious germs floating with the dust. Abundant water-supply and good sewerage have rendered possible and measurably safe, so far as the ordinary waste of life is concerned, the building of vast tenements which swarm with people. But the means of getting pure air, and especially of disposing of infectious material

often floating in it when it is confined, have not at all kept pace with the demands of health and cleanliness.

But when we turn to the larger and more liberally furnished dwellings of the well-to-do classes, we do not find everything reassuring from the standpoint of hygiene, for in some respects the rich are sadly handicapped by the "tyranny of things." Of course long- and thick-piled carpets afford persistent lurking-places for infectious as well as other dust. Certainly heavy hangings in a measure hinder the purifying action of the sunlight, shut the used air in and the fresh air out, and shelter floating matter which might otherwise escape. Without doubt complex upholstery with roughened fabrics increases the difficulties in the maintenance of cleanliness. But the usage of the householder in these matters will, after all, depend upon whether his practical devotion be most at Fashion's or Hygeia's shrine. We well may long for the coming of a time when clean, airy, simply furnished living-rooms shall replace the stuffy fabric-strewn apartments in which the fashionable citizen so much delights to-day.

In one particular, however, the devotee to cleanliness may be unreservedly insistent, and that is that in the cleaning of living-rooms, whether occupied by the sick or the well, the distinct and recognized purpose of the operation shall be to remove, and not simply to stir up, the over-gathering dust.

The past few years, so beneficently signalized by the revelations of the new germ lore, have seen marked departures from the traditional sweepings and dustings of a past era; and the emancipation of the housekeeper, and incidentally of the household, from the thrall of the pestiferous feather duster seems fairly under way. Still, some of the old barbarous travesties upon cleaning widely persist. The dry broom still seeks out in the deep recesses of the carpets not the coarser particles of dirt alone, but the hordes of living germs which were for the time safely ensconced; and among these what malignant forms the chances of the day may have mingled. These are all set awirl in the air; some gather on salient points of the fittings and furnishings; many stay with the



operator, to vex for hours the delicate breathing passages or the deeper recesses of the lungs. Then in the lull which follows gravity reasserts its sway, and the myriad particles, both the living and the dead, slowly settle to the horizontal surface, especially to the carpets. Then the feather duster comes upon the scene, and another cyclone befalls. The result of it all is that the dust has finally been forced to abandon more or less completely the smooth and shining surfaces where it would be visible, and is largely caught in the surface roughnesses of the carpets or upholstery or hangings, ready at the lightest footfall or the chariest touch to dance into the air again, and be taken into the lungs of the victims of the prevailing delusion—the delusion that the way to care for always noxious and offensive and often dangerous dust is not to get it out of the house, but to keep it stirring in the air until at last it has settled where it does not vex the eye.

By the use of moist tea-leaves in the sweeping of carpets, by the use of soft-textured fabrics, frequently shaken out-of-doors, or by moist cloths or chamois in dusting, much useless dust-scattering may be avoided. But no matter what the means employed, the final purpose of every household cleaning should be to get the dust, not afloat, but away.

Probably the most serious source of infection which one is liable to encounter in the usual ways of life is the occupancy at hotels of bedrooms vacated by consumptives without subsequent efficient disinfection and cleansing, and travel in sleeping-cars. I need not enter here into the harrowing details of desperate uncleanness which the ordinary railway travel brings to light. It is to be hoped that popular demand for reform in the routine of hotel-keepers and railroad managers in the matter of ordinary sweeping and dusting, and in the precautions against the spread of tuberculosis, may soon usher in among them a day of reasonable sanitary intelligence.

A belief in the communicability of tuberculosis is becoming widely diffused, and it would seem to be desirable, on the ground of policy alone, for the managers of summer, and especially of winter, resorts frequented by consumptives, to let

it be known in no uncertain way that their precautions against the spread of infectious diseases are effectually in line with the demands of modern sanitary science.

The members of families bearing a hereditary susceptibility to the acquirement of tuberculosis should strive to foster those conditions which favor a healthy, vigorous life, in occupation, food, exercise, and amusement, and remember that for them more than for others it is important to avoid such occupations and places as favor the distribution, in the air or otherwise, of the tubercle bacillus.

But when the individual has done what he can in making his surroundings clean, and in thus limiting the spread of the tubercle bacillus, there still remains work for municipal and State and national authorities in diffusing the necessary knowledge of the disease and its modes of prevention; in directly caring for those unable to care for themselves; in securing for all, such freedom from contact with sources of the disease as the dictates of science and humanity may require and the law permit.

To health boards, either national or local, must largely be intrusted the primary protection of the people against the danger from tuberculous cattle.

A national bureau of health might be of incalculable service in stimulating and harmonizing efforts made for the suppression of tuberculosis in various parts of the land, and in fostering research in lines which promise large practical return in the saving of life.

The United States has been keenly alive to the economic importance of certain diseases of cattle, and has done much to suppress among them various infectious maladies. But the most positive official relationship which the United States has thus far borne to this communicable and preventable disease of man which robs it each year of hundreds of thousands of its citizens, has been to place and maintain a heavy tax upon instruments and apparatus necessary for the recognition and study of tuberculosis and many other bacterial diseases, and, except recently and for a favored few, upon books in which,

and in which alone, can be found records of research upon which the means for the prevention of tuberculosis must be based.

Tuberculosis in this country has been officially almost entirely ignored in those practical measures which health boards universally recognize as efficient in the suppression of this class of maladies. Physicians are now required to report it to the local health boards in but few cities. Systematic measures of disinfection are rarely practised. But the official measures just mentioned have been found extremely useful in the limitation of other communicable diseases. While consumption is a communicable germ disease, it is, in fact, in the light of our present knowledge, when intelligently cared for, so little liable to spread that it is properly exempt from those summary measures which health authorities are justified in adopting with the more readily and less avoidably communicable maladies which we call contagious. Consumption is apt to involve such prolonged illness, and so often permits affected persons for months and years to go about their usual avocations, that general isolation would be both impracticable and inhumane. Moreover, for reasons which it is hoped are evident to the reader, isolation among those capable of caring for themselves is at present entirely unnecessary.

But while extreme measures are not called for, local health boards must soon act in the prevention of tuberculosis. For the present the wisest course would seem to be to attempt to secure the desired ends rather by instruction, counsel, and help than by direct and summary procedures.

Thanks largely to the persistent efforts of Dr. H. M. Biggs through many discouraging years, the city of New York stands foremost to-day among municipalities, great or small, the world over, in its intelligent and systematic official efforts to suppress the ravages of tuberculosis. But the task is difficult, advance is slow, and the facilities at hand are utterly inadequate.

There is no more pitiable spectacle in this land to-day than that of the hundreds of victims of advanced tuberculosis in

every large town who cannot be comfortably or safely cared for in the dwellings of the poor, and yet who are always unwelcome applicants at most of our hospitals, and at many are denied admission altogether. They are victims of ignorance and of vicious social and hygienic conditions for which they are not largely responsible, and States and municipalities, which are more to blame, owe them at least a shelter and a place to die. Unquestionably one of the urgent duties immediately before us in all parts of the land where tuberculosis prevails is the establishment of special hospitals in which this disease can be treated and its victims safely cared for.

And now at last remains to be spoken what word of cheer and hope our new outlooks may have given us for those who are already under the shadow of this sorrowful affliction. The dreams and aspirations and strenuous labors of the students of this disease have looked steadily toward the discovery of some definite and positive means of cure, but as yet full success lingers beyond their grasp. The methods for the early detection of tuberculosis which science has pointed out make it possible for affected persons to plan such modes of life and early seek such salubrious climates as promise a hope of recovery. We have studied closely the ways in which the cells of the body often successfully resist the incursions of the already seated germs, and learned how in many ways the natural forces of cure may be sustained and strengthened. We have learned much about certain complicating occurrences which often form the most serious features in the progress of tuberculosis of the lungs, and how they may be best avoided. And so to-day the outlook for those in the earlier stages of this disease is in a considerable proportion of cases extremely encouraging. It is no longer for us the hopeless malady which it was earlier believed to be. It is not necessarily a bitter losing fight upon which one enters who becomes aware that the finger of this disease is upon him. A long and happy and useful life may still be his if the conditions which favor his cure be early and intelligently fixed upon, and patiently and faithfully persisted in. The wise physician is here the best adviser

in climate and regimen, as well as in the proper selection of remedial measures, and the earlier his counsel is sought and acted on, the brighter will usually be the outlook for recovery.

The great and beneficent work which has been accomplished by Trudeau in the Adirondack woods, in at once widening the bounds of knowledge of tuberculosis and in carrying to a successful issue in so many the varied and delicate processes of cure, is a cheering example of what may be accomplished by the light of our new knowledge, in mastering a malady so long considered hopeless.



APPENDIX II

WARFARE AGAINST CONSUMPTION

WILL YOU HELP FIGHT IT?  
WHY? HOW?





## WARFARE AGAINST CONSUMPTION

### WHY FIGHT IT?

BECAUSE more people die of consumption than from any other disease.

Each year 1,095,000 of the people of the world die of it. In the United States over 100,000 die every year of consumption. Every day 3000, and each minute of the day two persons fall before this enemy. How many of your friends have died of it?

Because it is a disease which spreads from one person to another, and any one may catch it.

Because it is chiefly caused by the filthy habit of spitting.

Because it is a disease which can be stopped, and need not spread.

Because every one may and should help stop it.

Because already there is change for the better. The number of deaths from consumption is growing less. Twenty years ago there were many more deaths in proportion to the population than now.

If the tuberculosis death-rate of 1886 had been maintained the first nine months of 1902, four thousand more persons in Manhattan and the Bronx would have died of tuberculosis than actually died in these months.

Could anything be found more inspiring, more plainly indicative of the need for extending the work against this disease?

### HOW FIGHT IT?

By remembering these five points about the enemy:

I. People are seldom born with consumption.

II. It is caused by a very small living thing whose name is "bacillus tuberculosis."

III. This living thing comes from the sick person through the spit. Sometimes millions are coughed up and spit out in a single day by one consumptive person.

IV. This spit may dry, and the germs mix with the dust, float in the air, and settle on the walls or in the carpets.

V. They are then breathed in and settle in the throat and lungs, causing consumption of those parts.

#### HOW FIGHT IT?

By remembering these five points about the body:

I. Your body can resist these germs, so that they will not spread and cause consumption.

II. If your body is weak it may not be able to resist them.

III. Your body may become weakened. How? By strong drink, which is one of the best helpers the germs have. By other forms of dissipation. By too little food, air, and light. By the grip, typhoid fever, pneumonia, bronchitis, and sometimes a simple cold.

IV. Keep your body strong, so that you can resist the germs. How? Be in the open air as much as possible. Drink plenty of pure water. Keep early hours. Sleep eight hours out of the twenty-four. Live as regular a life as possible; eat plain good food; see that the bowels move freely every day. Consult a doctor if you have a cough, or are run down, or if you cannot stand as much work as you could formerly.

V. Do not spit yourself or allow your consumptive friends to spit on the floor, carpet, stove, wall, or street, or anywhere except in a cup or spittoon for that purpose. This cup should contain water so that the matter will not dry. When not at home, or in a place where a spittoon cannot be used, carry little pieces of tissue paper, and after use burn them.

Tell your friends that consumption is one of the oftenest cured of all chronic diseases, and can be cured in nearly all cases, but it must be taken very early.

Are you interested? If you wish to read more on this important matter, write to the Charity Organization Society, 105 East 22d Street, New York, for information.

APPENDIX 12

CIRCULAR ISSUED BY THE DEPART-  
MENT OF HEALTH

PRINTED IN ENGLISH AND, ON THE REVERSE SIDE, IN GERMAN,  
ITALIAN, YIDDISH, CHINESE, RUSSIAN



Issued by the Department of Health for the Committee on the Prevention of  
Tuberculosis of the Charity Organization Society, No. 105  
East Twenty-second Street

## CONSUMPTION IS A PREVENTABLE AND CURABLE DISEASE

INFORMATION FOR CONSUMPTIVES AND THOSE LIVING  
WITH THEM

Department of Health, southwest corner Fifty-fifth Street and Sixth Avenue,  
New York.

### *Consumption is Chiefly Caused by the Filthy Habit of Spitting*

CONSUMPTION is a disease of the lungs, which is taken from others, and is not simply caused by colds, although a cold may make it easier to take the disease. It is caused by very minute germs, which usually enter the body with the air breathed. The matter which consumptives cough or spit up contains these germs in great numbers—frequently millions are discharged in a single day. This matter, spit upon the floor, wall, or elsewhere, dries and is apt to become powdered and float in the air as dust. The dust contains the germs, and thus they enter the body with the air breathed. This dust is especially likely to be dangerous within doors. The breath of a consumptive does not contain the germs and will not produce the disease. A well person catches the disease from a consumptive only by in some way taking in the matter coughed up by the consumptive.

Consumption can often be cured if its nature be recognized early and if proper means be taken for its treatment. *In a majority of cases it is not a fatal disease.*

It is not dangerous to live with a consumptive, if the matter coughed up by him be promptly destroyed. This matter should not be spit upon the floor, carpet, stove, wall, or side-

walk, but always, if possible, in a cup kept for that purpose. The cup should contain water so that the matter will not dry, or better, carbolic acid in a five per cent watery solution (six teaspoonfuls in a pint of water). This solution kills the germs. The cup should be emptied into the water-closet at least twice a day, and carefully washed with boiling water.

Great care should be taken by consumptives to prevent their hands, face, and clothing from becoming soiled with the matter coughed up. If they do become thus soiled, they should be at once washed with soap and hot water. Men with consumption should wear no beards at all, or only closely cut moustaches. When consumptives are away from home, the matter coughed up should be received in a pocket flask made for this purpose. If cloths must be used, they should be immediately burned on returning home. If handkerchiefs be used (worthless cloths, which can be at once burned, are far better), they should be boiled at least half an hour in water by themselves before being washed. When coughing or sneezing, small particles of spittle containing germs are expelled, so that consumptives should always hold a handkerchief or cloth before the mouth during these acts; otherwise, the use of cloths and handkerchiefs to receive the matter coughed up should be avoided as much as possible, because it readily dries on these, and becomes separated and scattered into the air. Hence, *when possible, the matter should be received into cups or flasks.* Paper cups are better than ordinary cups, as the former with their contents may be burned after being used. A pocket flask of glass, metal, or pasteboard is also a most convenient receptacle to spit in when away from home. Cheap and convenient forms of flasks and cups may be purchased at many drug stores. Patients too weak to use a cup should use moist rags, which should at once be burned. If cloths are used they should not be carried loose in the pocket, but in a waterproof receptacle (tobacco pouch), which should be frequently boiled. A consumptive should never swallow his expectoration.

A consumptive should have his own bed, and, if possible, his own room. The room should always have an abundance of

fresh air—the window should be open day and night. The patient's soiled wash-clothes and bed-linen should be handled as little as possible when dry, but should be placed in water until ready for washing.

If the matter coughed up be rendered harmless, a consumptive may frequently not only do his usual work without giving the disease to others, but may also thus improve his own condition and increase his chances of getting well.

Whenever a person is thought to be suffering from consumption, the Department of Health should be notified and a medical inspector will call and examine the person to see if he has consumption, providing he has no physician, and then, if necessary, will give proper directions as to treatment.

Rooms which have been occupied by consumptives should be thoroughly cleaned, scrubbed, whitewashed, painted, or papered before they are again occupied. Carpets, rugs, bedding, etc., from rooms which have been occupied by consumptives, should be disinfected. Such articles, if the Department of Health be notified, will be sent for, disinfected, and returned to the owner free of charge, or, if he so desire, they will be destroyed.

*When consumptives move they should notify the Department of Health.*

*Consumptives are warned against the many widely advertised cures, specifics, and special methods of treatment of consumption. No cure can be expected from any kind of medicine or method, except the regularly accepted treatment, which depends upon pure air, an out-of-door life, and nourishing food.*

Persons desiring additional information or assistance should apply to the Department of Health, 55th Street and Sixth Avenue, New York, or the Charity Organization Society, No. 105 East 22d Street.

By order of the Board of Health,

ERNST J. LEDERLE, Ph.D.,  
President.

HERMANN M. BIGGS, M.D.,  
Medical Officer.



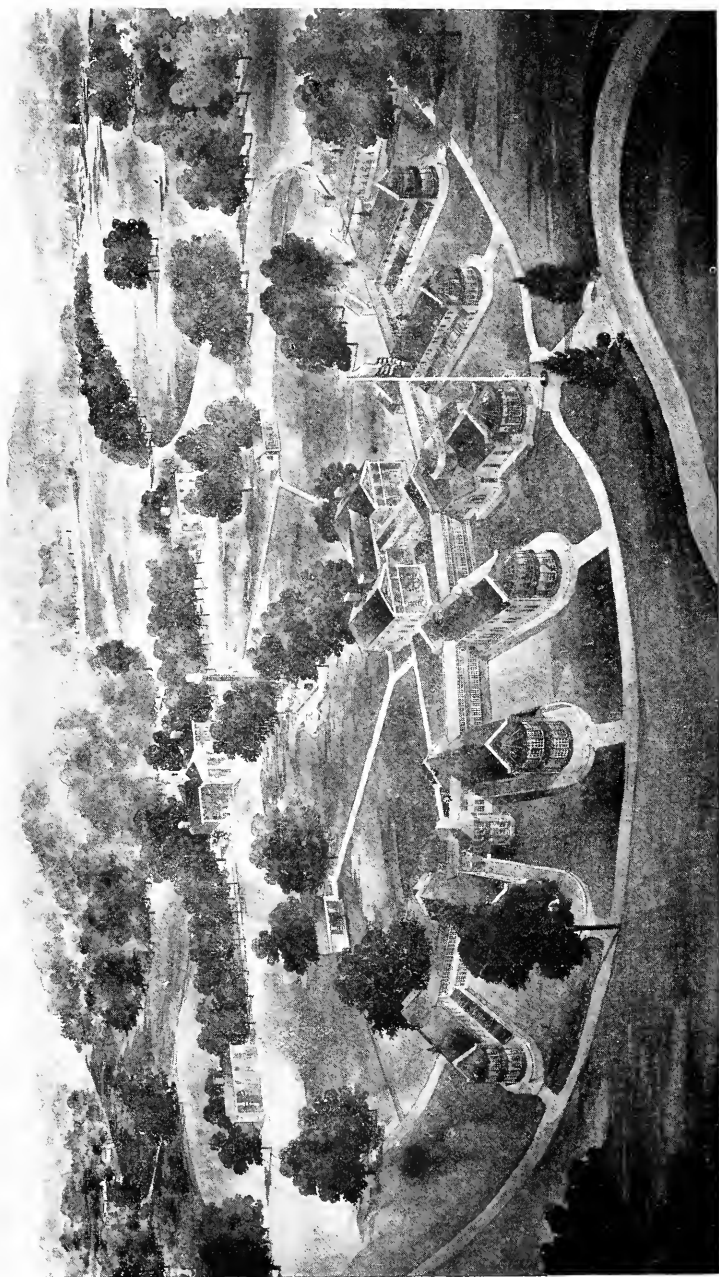


APPENDIX 13

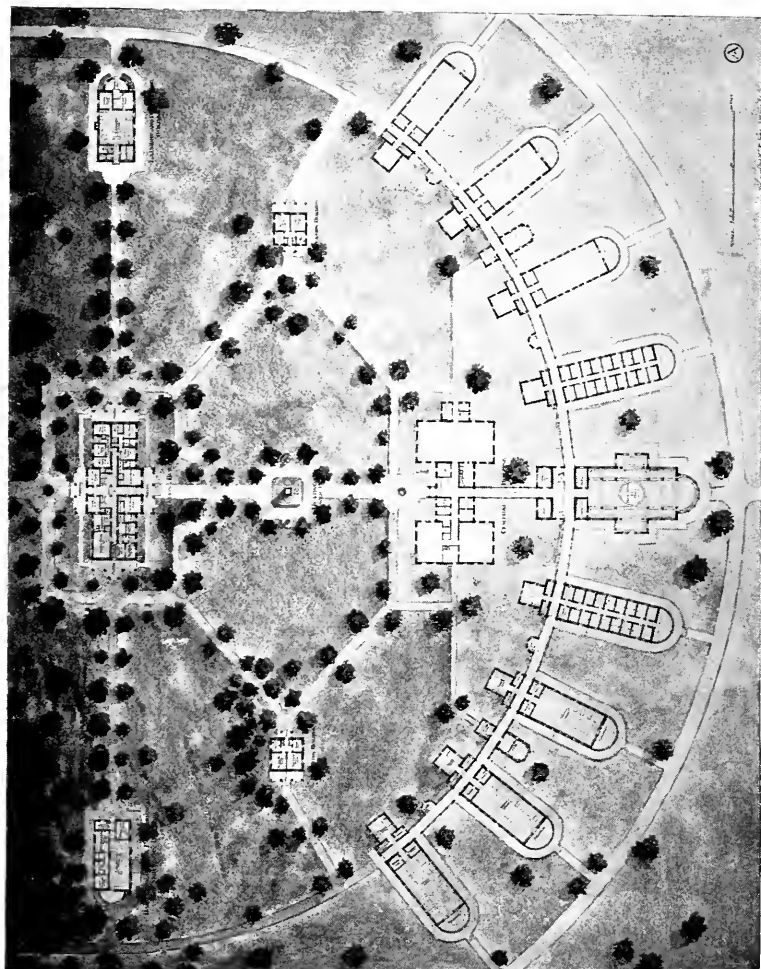
A MUNICIPAL SANATORIUM FOR  
CONSUMPTIVES

By RENWICK, ASPINWALL, & OWEN





BIRD'S-EYE VIEW OF A MUNICIPAL SANATORIUM.



GROUND-PLAN FOR A MUNICIPAL SANATORIUM.

## A MUNICIPAL SANATORIUM FOR CONSUMPTIVES

TWENTY-FIVE years ago mankind stood face to face with the great scourge tuberculosis, hopeless and helpless. Its cause was unknown, its onset was so insidious that the fate of its victims was commonly sealed while yet the nature of their malady was undiscovered. Preventive measures were wanting; the shadow of a sorrowful belief in hereditary taint lay heavy upon many families; medical treatment seemed of doubtful value. The task of the physician was chiefly to lead the hopeless as gently as might be to their rest.

To-day we know the cause of tuberculosis and the exact modes of its acquirement. It can be detected in its earliest stages, while yet the hope of cure is brightest. We know to-day just how the germs pass to the well from those already stricken, and how by the most simple and obvious measures of individual and public cleanliness the roll of fresh victims may be at once reduced. We know to-day that not to hereditary taint but to household infection is due the appalling destruction of families by this sinister disease. The physician of to-day is in command of such forces of healing as promise cure in many cases if the sufferers can be early and properly cared for where rest and food and fresh air and sunshine are available.

But the appalling death-rate from tuberculosis continues. It is a little lowered here and there it is true, but the disease still affects wellnigh one-half of the whole human race, causes the death of fully one-tenth of all who pass away in the United States, and kills about one-third of those who perish between the ages of fifteen and forty-five.

The reasons for the continuance of this malady and the untold misery and suffering which gather about it, are threefold:—first, the people at large do not understand the ways in which the disease is spread and are ignorant of the simple measures for its avoidance; second, many are careless or indifferent to the risks of sanitary uncleanness; third, the facilities for the care of the poor and the friendless who are stricken are utterly inadequate. Thus the larger proportion of the victims of tuberculosis are hopeless in sight of the hope which science holds out to all. And thus each uncared for sufferer is left to become a source of fresh infection to his fellows.

These are the main reasons why the preventable disease tuberculosis, after a quarter of a century of saving knowledge, is still the scourge of the human race.

How shall general enlightenment be secured? How shall the careless and the indifferent be induced to conform to the plain requirements of sanitary cleanliness? How shall the stricken poor and the friendless be offered the hope for recovery which humanity urges? These are problems which each community must solve for itself.

Boards of Health can do much in informing the public, in enforcing general sanitary regulations, in disinfecting rooms and dwellings in which consumptives have lived and died, and in gathering statistics of the disease. Beyond this they can do little, and this leaves some of the main things undone. The New York City Board of Health has been especially effective in accomplishing what its scope and facilities have permitted to suppress this scourge. But still five thousand lives are sacrificed each year in this city alone to this preventable disease.

The Charity Organization Society of New York has now undertaken to meet the critical situation in this city by the establishment of a permanent Committee on Tuberculosis.

To remedy the two first causes mentioned above, the Committee has endeavored to enlighten the public by lectures and through the distribution of pamphlets setting forth the facts about the disease. To aid in the solving of the problem aris-

ing from the third cause, the Committee has now had prepared plans for a municipal sanatorium for the care of consumptives, and submitted them to the Health Department of the City of New York.

Under the provisions of Chapter 327, Laws of 1900, the city is empowered to establish, equip, and maintain, outside of its corporate limits, a hospital or hospitals for the regular treatment of pulmonary tuberculosis, provided the Board of Health shall deem it necessary.

The plans are described in the following letter of the architects:

“NEW YORK, February 20, 1903.

“*To the Committee on the Prevention of Tuberculosis of the Charity Organization Society of the City of New York:*

“GENTLEMEN: We beg to hand you herewith plans for a proposed municipal sanatorium for the treatment of tuberculosis, to be located in the country near the city of New York. These plans are based upon the suggestions made to us by your Committee, and upon our experience gathered in the actual building of the Adirondack Cottage Sanatorium at Saranac Lake, the Stony Wold Sanatorium at Lake Kushaqua, and on the study of the proposed sanatorium at Denver, Colorado. *Site.*—As no site has yet been chosen for this sanatorium, we have been obliged to assume the natural conditions of the ground and have adopted a site giving a southwestern exposure for the pavilions, with a protecting hill to the north-east shielding the buildings from the most violent storms. This condition is shown in our bird’s-eye view of the institution. This site gives sunlight to the patients in the pavilions all day.

“As you drive toward the sanatorium on the public roads you would first have a general view of the pavilions above you on the heights. The private driveway of the institution circling around below the pavilions will lead in a gradual ascent to the administration building, giving a fine view of the entire grounds as you approach the latter building. The drive will continue

around the administration building and back to the central building, passing over the boiler-house, which will be partly underground, allowing coal to be dropped directly into the bunkers beneath. From the central building a covered corridor will lead back to and join with the main corridor connecting all the pavilions. On the main axis and directly back of the central building is the large recreation hall and assembly room, which also acts as a general solarium. On the corridors connecting the pavilions and midway between the second and third pavilions on each side will be located the small diet kitchens with the small dining-rooms. On this corridor will also be located the staircases leading from the first to the second stories. On the transverse axis on a line with the boiler-house will be located the isolated pavilions for contagious diseases one for men and one for women. On a line with the administration building will be located on one side the laboratory, and on the other the laundry building. The boiler-house and engine-room are located, as you will notice, in a central position, enabling the heat to be distributed in a rapid and economical manner in all directions to the various buildings. Electric light can also be economically distributed from this point. By sinking the building below the finished grade, carrying the main driveway over its roof, and by treating the main chimney in an architectural manner, the unsightly quality of this type of building is done away with and the great advantage is gained of distributing heat and light from a central point. By terracing the ground, windows may be placed on the side of this building, affording light and ventilation to the boiler- and engine-room. The large recreation hall acts as a natural division between the men's and women's portions of the building. The laboratory and laundry buildings being placed off to the ends may be partially or wholly hidden by trees and shrubbery, but at the same time they will be easy of access. The camp, where the patients will live in tents, will be placed off to the side as shown, with the tents arranged in streets with wide spaces and pleasing landscape effects, and with a recreation hall conveniently located. At the centre of



each block of tents will be placed a toilet and bath building for the block, with paths leading to same and with shrubbery arranged to hide the building. This camp may be made very attractive by proper arrangement of shrubbery, and may also give light employment to the patients in arranging and caring for the grounds and gardens.

"We have selected as the style to be followed in this group of buildings the Colonial type, which gives so homelike and cheerful an effect where used. At the same time it is very economical and simple, being inexpensive and easily followed out in execution. The general treatment would be in red brick with white stone trimmings, with slate roofs. The corridors connecting the various buildings, the solariums on the ends of the pavilions, and the dome of the large recreation hall being constructed, as far as possible, of glass. This treatment should insure an interesting, cheerful, and uniform group seen with a setting of green foliage and natural scenery.

"The interior arrangement and finish of the various buildings would naturally be up to the standard of the latest hospital construction. It is not contemplated to construct the buildings fireproof, because of the cost, and the fact that the buildings are only two stories high. The plastering to be done throughout in hard finish with all corners, both of walls and ceilings, rounded, and with rounded corners at all windows and doors. The finished floors to be of the latest fireproof composition construction with sanitary bases. The doors to be flush paneled throughout, the trim to be without mouldings or corners. All buildings to be provided with stand pipes and fire plugs on all floors, at least one of these to each ward. Wall cuspidors to be placed in the dining-hall for patients, and in the corridors connecting the wards at intervals of every eighty feet; these cuspidors to be supplied with running water. Sanitary drinking fountains also to be supplied in the same manner, but at different locations.

"The administration building (see Drawings A, B, and D) will have a large hall on the first floor running through to the rear of the building, with halls at right angles leading to the

wings of the building. On the right of the entrance is the business office, the superintendent's office opening from it. Next to the superintendent's office is the board room. On the left as you enter is the reception room. On the left also is the superintendent's suite, consisting of a sitting-room, dining-room, pantry, two bed-rooms, and a bath. On the left is also the suite for the assistant resident physicians, consisting of a sitting-room, two bed-rooms, and a bath. On the right of the main hall are the apartments of the resident physician, the director of laboratories, and the apothecary, together with their baths. On the second floor of the administration building will be the apartments of the head nurse, two women physicians, women nurses, and three guest-rooms for members of the board, or others who visit the institution overnight. On the third story will be the majority of the nurses. We have provided accommodations for forty-four nurses in this building, allowing two nurses to a room, and have provided a sitting-room, library, and ample bathing accommodations for them.

“The central building (see Drawings A, C, D) will contain, on the first floor to the right as you enter, the doctor's ante-room and office, the office of the head nurse, toilet rooms, and the staff and nurses' dining-rooms, with pantries for serving same. On the left of the main hall is the drug-room, the dining-room for male patients, and pantries for serving. A separate entrance to the dining-rooms from the grounds is shown, with lavatories and coat room, so that patients living in the tents may enter direct to their meals. A stairway leads to the women's dining-room on the second floor. On the second floor (Drawing E) and over the dining-room below is the women's dining-room of the same size and with equal serving-rooms and cloak and toilet facilities. Ample dumb-waiters are provided from the kitchen below. In the other wing on this floor are the women servants' dormitories and bath-rooms. An apartment is provided for the matron so that she may have supervision of the servants. In the basement (Drawing C) is the great kitchen with its complete cooking and

serving plant, including sterilizing and washing steam vats for dishes, knives, forks, etc., the bake shop and ovens, butcher shop, storerooms for various stores, the office of the house-keeper, the pantry for serving the dining-rooms above, toilets and the dining-rooms for male and female servants.

"It is proposed to make of the recreation hall (Drawings A and D) a general assembly and meeting room in which religious services, lectures, musicals, amateur theatricals, etc., may be held and all general social intercourse of the patients take place. A stage may be erected at the end of the circular apse for all these purposes. By constructing the dome of glass, this hall may also be used as a solarium during the day. Toilet facilities are provided for both sexes. The windows in this hall are all open down to the floor, affording access to the terrace surrounding the hall and ease in emptying the room in case of necessity. Opening off the corridor leading to the central building will be the operating and throat room, together with a lift to take patients from one floor level to the other.

"Extending on either side of the main axis and connected by the corridors are the pavilions for the patients (Drawings A and D). They are two stories in height and arranged in fan-like form for the purpose of giving each building a maximum of sunlight. The first pavilion on either side of the recreation hall has been divided up into single rooms, sixteen on each floor, with the solarium at the south end. On each floor is the nurse's room with lavatory and clothes room, and on the opposite side of the corridor a housemaid's room, linen room, and toilet and bath-room for the ward, containing a bath-tub, two showers, three urinals, three closets, and four basins for men, and two baths, one shower, three closets, and four basins for women. The ward pavilions, of which there are three on either side of the separate room pavilions, will each accommodate thirty-two patients, sixteen on each floor, and have the same toilet, bath, clothes, linen, and nurses' accommodations as the separate room pavilions. An allowance of 1300 cubic feet of air per patient has been made. These pavilions are also arranged with a solarium at the end

of each ward so that a patient in bed may be wheeled directly into the solarium, and those patients occupying the ground floor may be wheeled directly from the ward out on the veranda. Movable screens would be provided on these verandas to shut off draughts.

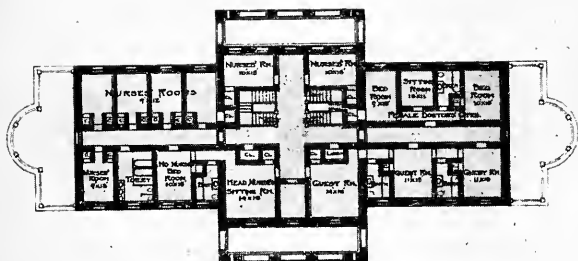
“At the centre of each group of pavilions is located a two-story diet kitchen (Drawings A and D) to serve the four wards on each floor nearest it, with all proper equipment; and on the opposite side of the corridor is located a small dining-room for the patients who, while able to be out of bed, are yet unable to go to the main dining-room. Food may be taken to these diet kitchens from the main kitchen and storeroom without passing through the main corridors, either by the paths shown, or through the basement corridor beneath the main corridors.

“Two isolation pavilions (Drawings A and D) are provided on the grounds, one for male and one for female patients, each containing two rooms for patients, bath, nurses' rooms, and closets. These buildings may be used for any cases of contagious or other diseases which it may be desired to segregate.

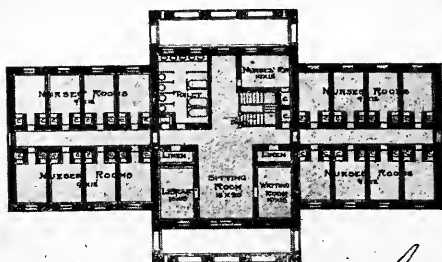
“The laundry building (Drawings A and D) is located on the right of the administration building, and will contain a complete modern laundry equipment run by electricity and with all proper steam connections, a disinfecting plant, assorting room, storeroom, and clean-clothes room on the main floor. The second floor will be divided into two rooms for the male servants, with a sitting- and bath-room for them.

“The bacteriological and pathological laboratory (Drawings A and D) is situated on the left of the administration building and contains in the basement the morgue, cold storage, and storerooms. On the main floor will be the pathological laboratory, the office, and the record room, the autopsy room, with lift to communicate with morgue, storeroom, and toilet rooms. On the second floor will be the bacteriological laboratory with its attendant rooms and office for the director of laboratories.

“We have shown a scheme for the arrangement of tents with alternate plans, either one of which may be preferred (Drawings E, F, and G). In our tent plan we have endeavored to pro-



SECOND FLOOR PLAN



THIRD FLOOR PLAN

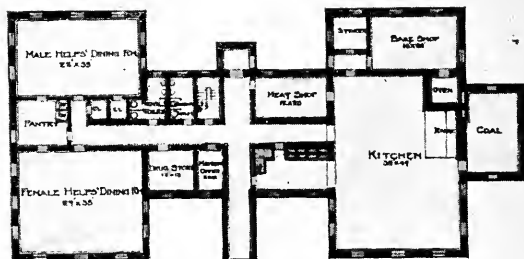
ADMINISTRATION BUILDING  
FOR A

MUNICIPAL SANATORIUM SUBMITTED TO THE  
BOARD OF HEALTH BY THE COMMITTEE ON THE  
PREVENTION OF TUBERCULOSIS OF THE  
CHARITY ORGANIZATION SOCIETY

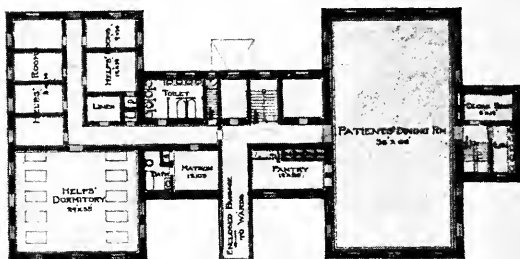
SCALE 1/8" = 1'-0"

*Revised by [Signature]*  
*387 7th Ave*





BASEMENT PLAN



SECOND FLOOR PLAN  
CENTRAL BUILDING  
FOR A

MUNICIPAL SANATORIUM SUBMITTED TO THE  
BOARD OF HEALTH BY THE COMMITTEE ON THE  
PREVENTION OF TUBERCULOSIS OF THE  
CHARITY ORGANIZATION SOCIETY

SCALE 1" = 10' 0"

*Wm. H. Sullivan*  
*Architect*  
367 1/2 N. Ave



duce an economical and at the same time attractive lay-out. The tents are arranged in squares with a large recreation hall in the centre, with broad streets and avenues radiating from this building. At the centre of each square is located a toilet and bath building properly hidden by shrubbery. Drawing E represents the concentrated plan with a capacity of 112 tents, each tent measuring 14 x 16 feet, with an 8-foot platform. This scheme covers an area of  $8\frac{3}{4}$  acres. Drawing F represents the extended plan of 112 tents, covering an area of  $26\frac{1}{2}$  acres. Drawing G represents the extended plan of 120 tents, covering 35 acres. In scheme G the tents will be 35 feet apart and in the concentrated scheme 25 feet apart. In the extended schemes the arrangement of the toilet and bath buildings and recreation hall has been varied to suit the plan. Guard houses have been provided for the orderlies in charge at points which command the streets and where they may have direct telephonic connection with the central group of buildings. Each tent will be provided with an electric light and fixed wardrobe for clothing as well as the necessary furniture. It is desirable, if possible, to have rubble-stone masonry foundations under the tents and platforms proper. The construction of the tents would be preferably of planed timber bolted together at the joints, as per diagram shown on Drawing E, and the frame should be kept well painted. The care of the lawns and flower-plots between the tents should afford light and pleasant work to the patients.

“As will be noted by the plan, the location of the power-house is midway between the various buildings, and is so arranged that power and light can be distributed most economically to all of the buildings from a central point. It is proposed to heat all of these various buildings by means of direct radiation, either steam or hot water being used to convey the heat from the power-house to the various buildings. It is intended to use the exhaust steam from the electric light engines to furnish the heat as far as it will go, and to make up the deficiency by using live steam from the boilers. In this way the most economical system in coal consumption is ob-

tained. The boiler plant will consist of three horizontal tubular boilers, each of 125-horse-power capacity, properly set in brick-work, with all necessary connections. It is estimated that the heating and laundry work will require about 225 horse-power, and this power includes that necessary for the electric light engines. It is deemed best to install a surplus amount of power divided up into three units so that there will at all times be one spare unit, which may be laid off for any necessary repairs. The heating will be accomplished by means of direct radiators and coils located in the various rooms, and the pipes for distributing this heat will be laid in underground conduits all properly protected against any undue loss of heat in transmission. All the condensation from the various buildings will be returned direct to the boiler-house, so that there will be no loss, and any condensation will be used over again. There will be required approximately about 20,000 square feet of radiators in the various buildings.

“It is proposed to install a complete lighting plant in the boiler-house. The plant will consist of two 50-kilowatt direct-connected units operated at 125 volts, and one 25-kilowatt direct-connected unit operated at 125 volts. These machines will be connected to high-speed engines, requiring from eighty to ninety pounds steam pressure, the exhaust being used for heating. A complete marble switchboard with all the requisite feeders for distributing the current to the buildings will be provided, the feeders being run in conduits as an underground system. A system of power distribution for the kitchen and laundry buildings will also be provided, run in the same manner as the lighting feeders. Approximately twenty arc lamps of low-tension type, arranged on ornamental poles, will be located on the grounds; all the wiring for feeding same being included in the underground system. The various buildings will be wired for electric lighting and power where required for a total of approximately 1200 sixteen c. p. lamps, including the tents and outbuildings. The wiring throughout the building will be run according to the latest methods, using steel conduits, slate panel boards, and the entire system being fire-



proof. It is further proposed to arrange a system of telephones for connecting the various buildings and guard houses to a central station in the administration building. This system will be of the latest type, the wiring all being run in circuits so as to be easily removable. The necessary bell and annunciator system for the official portions of the hospital will be provided, using the best grades of apparatus, and furnishing a complete method of communication. A watchman's clock system, the register being located in the administration building, and so arranged that the watchman, in making his rounds of the building, records his presence at regular intervals, is contemplated, using the very latest apparatus for this work. In short, a complete electric system, such as is required for the most modern form of hospital building, will be arranged for.

"At present it is proposed to build the central building, the boiler-house, four pavilions with their corridors, the laboratory building, and the laundry, together with the tents and their attendant toilet and recreation buildings. This will give a capacity of 224 patients in the tents and 128 in the four pavilions, making a total of 352 patients. It will be absolutely necessary to have the central building, boiler-house, the laboratory, and laundry buildings in order to supply the wants and necessities of the patients living in the tents. These necessary buildings can be arranged to hold temporarily all of the departments which will ultimately be housed in the administration building, owing to the smaller number of people to be employed at first.

"The cost of building a sanatorium of this nature depends to a certain extent on the natural conditions at the site, the locality, and the condition of the building industry in general at the present time. By the natural conditions of the site we mean its accessibility to a railroad or water base, the distance required in hauling, the grades, natural surroundings, etc. By the locality we mean the distance from New York City, the abundance of local labor, ability of local contractors, and the labor situation. By the last condition, we mean that at the present time all building is very expensive, and there seems very little chance of a decrease in the cost of materials, etc.

In making our estimate of cost we have assumed that at present the intention would be to erect the tents as shown, together with the buildings in the tent group, and with the buildings of the central group necessary to make a working sanatorium. These buildings would be the central building, the boiler-house, the laboratory building, the laundry building, four pavilions, and the necessary connecting corridors. A careful estimate of the cost of the above, made with as close a reference to the conditions mentioned as it is possible to assume, would be \$278,000. The cost of the balance of the buildings in the central group, shown in our complete lay-out, would be \$252,000, making a total cost of \$530,000.

If it is considered practicable and desirable, two of the four pavilions proposed to be erected at once, might be omitted, making a saving of \$59,000, which would reduce the initial cost to \$219,000. We summarize below the cost and capacity of the sanatorium on the basis above stated :

“If tents (112) are built with two pavilions and the necessary central buildings, giving a capacity of 288 patients, the cost will be \$219,000.

“If tents (112) are built with four pavilions and the necessary central buildings, giving a capacity of 352 patients, the cost will be \$278,000.

“If tents (112) are built with eight pavilions and the complete group of buildings, giving a capacity of 480 patients, the cost will be \$530,000.

“Respectfully,

“RENWICK, ASPINWALL, & OWEN.”

APPENDIX 14

PLANS FOR A MUNICIPAL SANATORIUM  
FOR CONSUMPTIVES

PREPARED BY  
MESSRS. HOWELLS & STOKES  
ARCHITECTS



## PLANS FOR A MUNICIPAL SANATORIUM FOR CONSUMPTIVES

NEW YORK, May 29, 1903.

*To the Committee on the Prevention of Tuberculosis, Charity Organization Society, 105 East 22d Street, City.*

GENTLEMEN:

We submit herewith, in accordance with your invitation, drawings for a municipal tuberculosis sanatorium to accommodate 500 patients. The plan comprises: (1) an administration building containing public reception rooms, doctors' offices and examination rooms, and, in a separate wing, a public dining-hall. The basement of this building contains kitchens and general service, and the nurses and orderlies are accommodated in separate wings on the second and third floors; (2) the male and female wards accommodating 200 patients, occupying opposite sides of the plan and separated by a low building containing public recreation rooms and assembly hall; (3) an encampment accommodating 300 patients; (4) necessary adjuncts, such as power plant, laboratories, contagious wards, etc.

We have chosen and developed a type of plan which, we believe, permits of greater economy in construction, while securing much more light, air, and sunshine and a far better outlook for the various buildings than is possible in any type where the buildings are arranged in a compact group, usually presenting but a comparatively small surface to the sun, and necessarily overlooking one another in a way to interfere seriously with privacy as well as with a proper circulation of air.

The object of close concentration is, of course, to secure economy of operation and service; but a close comparison of the two types will, we think, convince that the slightly increased distances to be traversed, and the somewhat greater cost of the heating and plumbing systems in the one which we have selected, are more than compensated for by the greater simplicity of arrangement, the greater economy of general construction, the better outlook, the greater amount of sun, and the better circulation of air which this type permits.

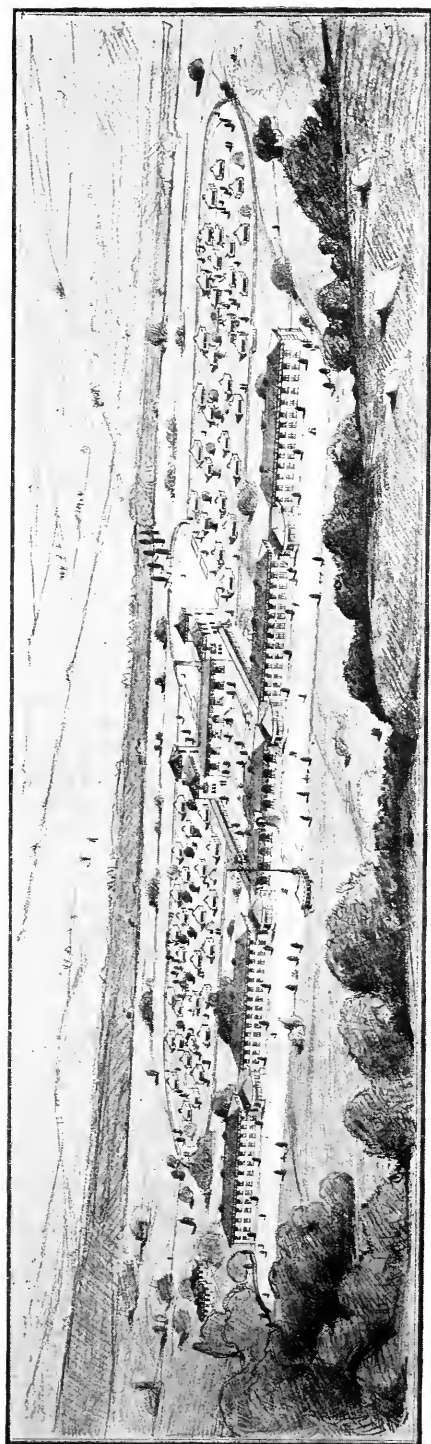
We estimate the cost of the buildings, including the encampment, as shown on our drawings, at about \$407,000, made up as follows:

Six ward pavilions at \$35,000 each, including solarium.....	\$210,000
Other buildings, including covered passageways.....	117,000
Heating system, including plant .....	48,000
Lighting system, including electric plant.....	23,000
Tents, including platforms and frames.....	9,000

These figures are based upon estimates received from reliable contractors. The cost of grading, planting, the building of roads, paths, etc., would, of course, depend on the nature of the site. On a comparatively level site, or a gentle slope, such as is shown on our drawings, \$50,000 would probably cover this item of expense.

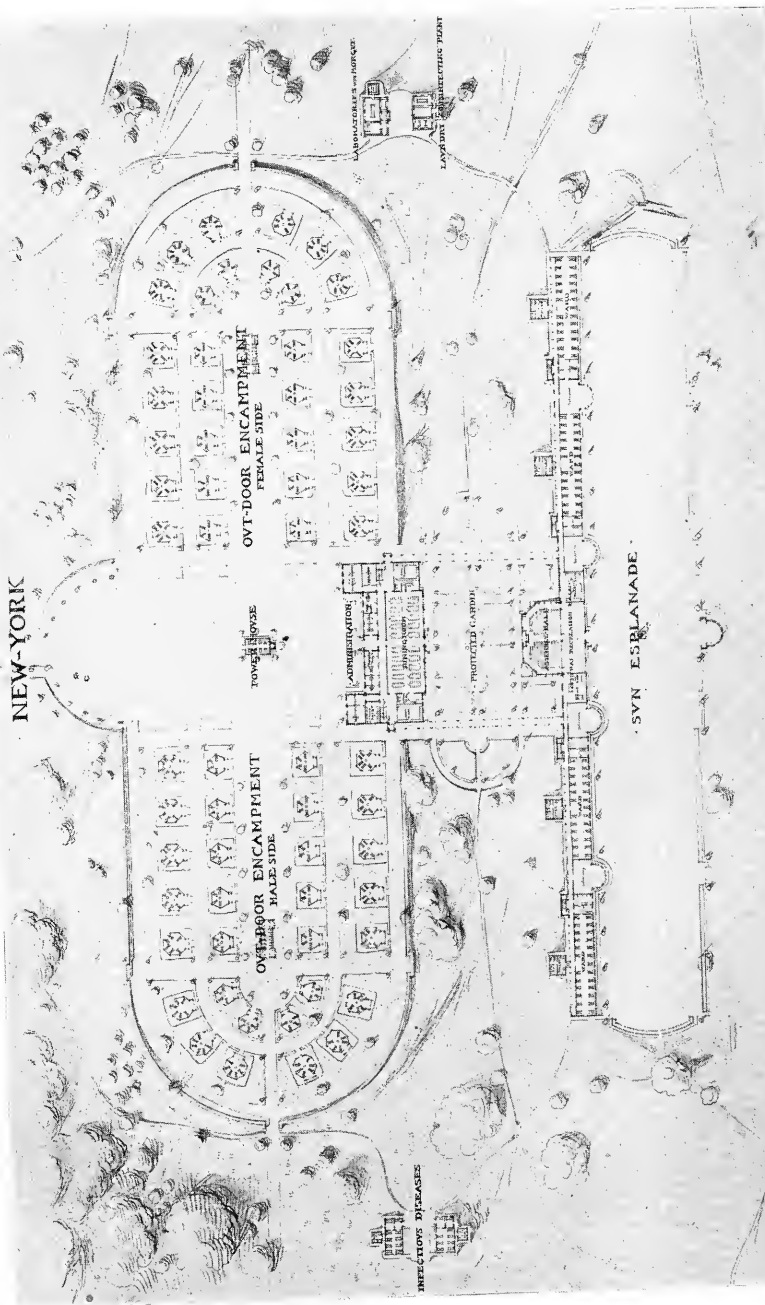
The following notes are offered in further explanation of the drawings:

Cheerfulness of immediate surroundings and an interesting and pleasing outlook are so important in the treatment and cure of tuberculosis as to demand most careful attention in the design of all buildings intended for the occupancy of tuberculous patients. They are of special importance in those buildings in which the patients sleep, and in the recreation parlors, or solaria, in which the greater part of their time within doors is spent. To this end, the main wards or home-pavilions, together with their connecting solaria, have been placed in the foreground of the plan on a broad terrace with a southern or southeastern exposure, which is supposed to command an ex-



PERSPECTIVE OF MUNICIPAL TUBERCULOSIS SANATORIUM.

NEW-YORK



GENERAL PLAN FOR A MUNICIPAL TUBERCULOSIS SANATORIUM.



tended view, and from which, as well as from the pavilions and solaria, the quiet and peaceful view can be fully enjoyed.

The main pavilions have been divided into two groups of three pavilions each—one group for male, the other for female patients. These two groups are connected with the other buildings composing the main group of the sanatorium by covered galleries which afford sufficient protection from inclement weather but do not appreciably interfere with the free circulation of air, etc.

In the general design of the buildings and in their architectural treatment we have attempted to combine simplicity, economy, restful dignity, and a cheerful aspect.

The choice of materials appropriate for the exterior of the buildings is practically unlimited. We have suggested in our design the use of common brick covered with stucco, which is a substantial and economical form of construction and can be frequently whitewashed with but little expense, and red tile or green copper roofs, which would give a cheerful and cleanly appearance. Hard plaster and the simplest hospital trim are used throughout the buildings.

The wards are two stories in height, accommodating fifty patients on each floor.

All plumbing in connection with the wards is concentrated in a small two-story pavilion connected to its ward on each floor by an enclosed passage.

The wards are eleven feet in height, and are provided, in addition to the ordinary windows, with a series of transoms near the ceiling in the front and rear walls, so arranged that a free circulation of air may always be had without causing a draught in the lower portion of the room. Provision is also made, by means of a movable sash, for a free circulation of air beneath the floors of the wards and galleries.

All heating and plumbing pipes, electric light and fan conduits, telephones, bell work, etc., are carried in trenches beneath the corridors and covered passages.

A general heating plant is provided for the main group of buildings, comprising the administration building, the recrea-

tion building, and the ward pavilions, the outlying buildings being heated by small separate plants. With proper insulation, the loss of heat in the farthest pavilion involved by this system would be less than one per cent. The gravity return system of hot-water circulation is used.

Radiators are placed in open recesses under the windows. These radiators are fixed by brackets to the walls several inches above the floor, and stand out far enough to permit of the walls behind them being easily cleaned.

Electric lights are provided throughout; also outlets for movable electric fans.

A bacterial sewage purification system of disposal is provided at some distance from the buildings.

The ground area actually covered by the proposed plan is forty acres, although the grounds belonging to the sanatorium are supposed to contain many times this acreage. Only that portion of the property which has been formally treated is shown in the accompanying plans; the remaining grounds are supposed to be informally treated with wooded drives and walks, farm lands, etc.

Respectfully submitted,

HOWELLS & STOKES.

APPENDIX 15

MUNICIPAL SANATORIUM FOR INCIPI-  
ENT CASES OF TUBERCULOSIS

A REPORT FROM THE  
HON. HOMER FOLKS,  
COMMISSIONER OF THE DEPARTMENT OF PUBLIC CHARITIES,  
TO THE BOARD OF ESTIMATE AND APPORTIONMENT OF  
THE CITY OF NEW YORK, JULY 15, 1903



## MUNICIPAL SANATORIUM FOR INCIPIENT CASES OF TUBERCULOSIS

DEPARTMENT OF PUBLIC CHARITIES,  
COMMISSIONER'S OFFICE,  
FOOT OF EAST 26th STREET, NEW YORK.

HON. SETH LOW,  
Chairman Board of Estimate and Apportionment,  
City Hall, New York City.

SIR: On April 14, 1903, a resolution was unanimously passed by the Board of Aldermen which became effective by your approval on April 24th, as follows:

*Whereas*, It has been determined that tuberculosis of the lungs, or consumption, is a communicable disease, and also that it can be cured, or at least arrested, especially in its early stages; and

*Whereas*, It is one of the greatest scourges of humanity in this city, as elsewhere; and

*Whereas*, The present means at the disposal of this city for coping with this dreaded scourge are totally inadequate; and

*Whereas*, The best and most effective modern scientific methods for treating consumption are, by reason of their expensiveness, out of reach of the poor, who are, nevertheless, the greatest sufferers from the disease; be it

*Resolved*, That this board is in favor of the establishment by the city of New York, within the shortest possible time, of a hospital in the near neighborhood of the city for the treatment of consumptives; and

*Resolved*, That the Commissioner of Charities be, and he is hereby, requested to prepare a report on the establishment of such a hospital, showing the amount of ground necessary, the proper location, the general type of building required, and the probable expense of the land, building, and maintenance, and such other details as may be necessary to admit of intelligent action; and

*Resolved*, That the Commissioner of Charities be, and he hereby is, requested to submit said report to the Board of Estimate and Apportionment with a request for an appropriation of the amount of money sufficient to establish and maintain such an hospital; also

*Resolved*, That the president of the Board of Health be requested to supply an estimate to this board, showing, as near as may be, the total number of persons in this city now suffering from consumption, and giving as careful an estimate as may be of the number of new cases which may be expected to develop each year for the next five years, in order that this board may have an approximate basis for judging of what hospital accommodation it might probably be necessary to provide, in order to take care in a proper manner of all persons stricken with this disease; and

*Resolved*, That the president of the Board of Health be requested to state to this board whether, in case sufficient hospital accommodation were provided to take care of all cases of consumption that should develop, there would be any scientific basis for the belief that consumption as a scourge—that is to say, as one of the leading causes of death—could be abolished in this city, and if so within what period of time; also

*Resolved*, That if there are certain simple, physical exercises, requiring little or no apparatus, and which are calculated to ward off consumption from those persons predisposed to it, the president of the Board of Health be, and he hereby is, requested to print and distribute plain and practical and readily intelligible instructions, describing and illustrating such approved methods of lung and chest development and explaining their object and probable results.

Pursuant to the instructions therein contained, I beg to submit the following report on the establishment of a municipal sanatorium for consumptives:

In considering the question of location, it seemed to me that the first step was to ascertain what elevation, if any, is now considered essential by the best medical authorities for such an institution as the one proposed. Until recently physicians have, as a rule, held that a very considerable elevation is necessary for the treatment of this disease. Whatever elevation is considered essential will of necessity determine the limits within which the choice of a particular location may be made. I therefore addressed a letter on May 6th to eleven eminent physicians, all of whom are connected either with hospitals for the treatment of consumption or other movements for the prevention of the spread of this disease. All of these physicians have kindly replied, many of them stating in some detail their views on the question. There seems to be unanimity of opinion that an out-of-town site with some elevation is essential. Seven of the eleven consider an elevation of from 600 to 1000 feet satisfactory; two suggest 1200 to 1500 as extremely desirable; and two strongly favor an elevation of 2000 feet.

In addition to an elevation of from 600 to 1000 feet, the requirements in the matter of location, as indicated by these medical authorities, are a porous soil, opportunity for good drainage, sufficient remoteness from cities and villages to ensure pure air, shelter from the north and northeast winds, an abundant water supply of good quality, an attractive outlook, and accessibility to a railway station. I have carefully examined the topography of the several counties reasonably accessible to New York City, as shown by the maps of the United States Geological survey, and have examined in person a number of sites. I am prepared to state that there can be found within a distance of fifty miles from New York City, and probably within forty miles, a considerable number of sites offering an elevation of from 600 to 1000 feet, and in a reasonable degree the other requirements indicated above. This would

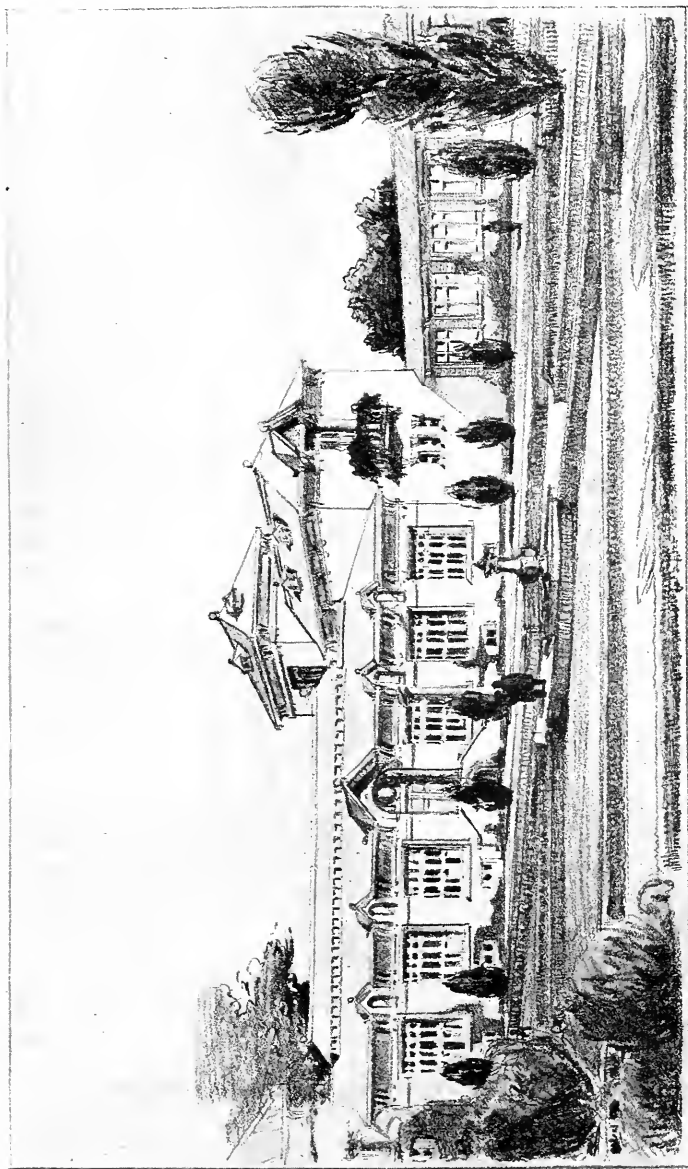
mean that the friends and relatives of the patients could visit them without losing more than a half day from their usual employment, and at an expense not exceeding \$1.60 for railroad fare, or if half rates could be secured, as would probably be the case, not exceeding eighty cents. These considerations will prove to be important in their influence upon the willingness of patients to be sent to the sanatorium.

To secure the use of any one of these sites, it must be selected by the Board of Health of the city, and it will then be necessary, under existing legislation, to secure the consent of the town board, the county board of supervisors, the State Board of Health, and presumably the local Board of Health. Under these circumstances, it does not seem advisable at this time to recommend any particular site. I suggest that a competent expert be appointed to devote all his time to the examination of sites and securing the necessary consents for such site as the Board of Health may select, as soon as the Board of Estimate and Apportionment takes favorable action on the general plan.

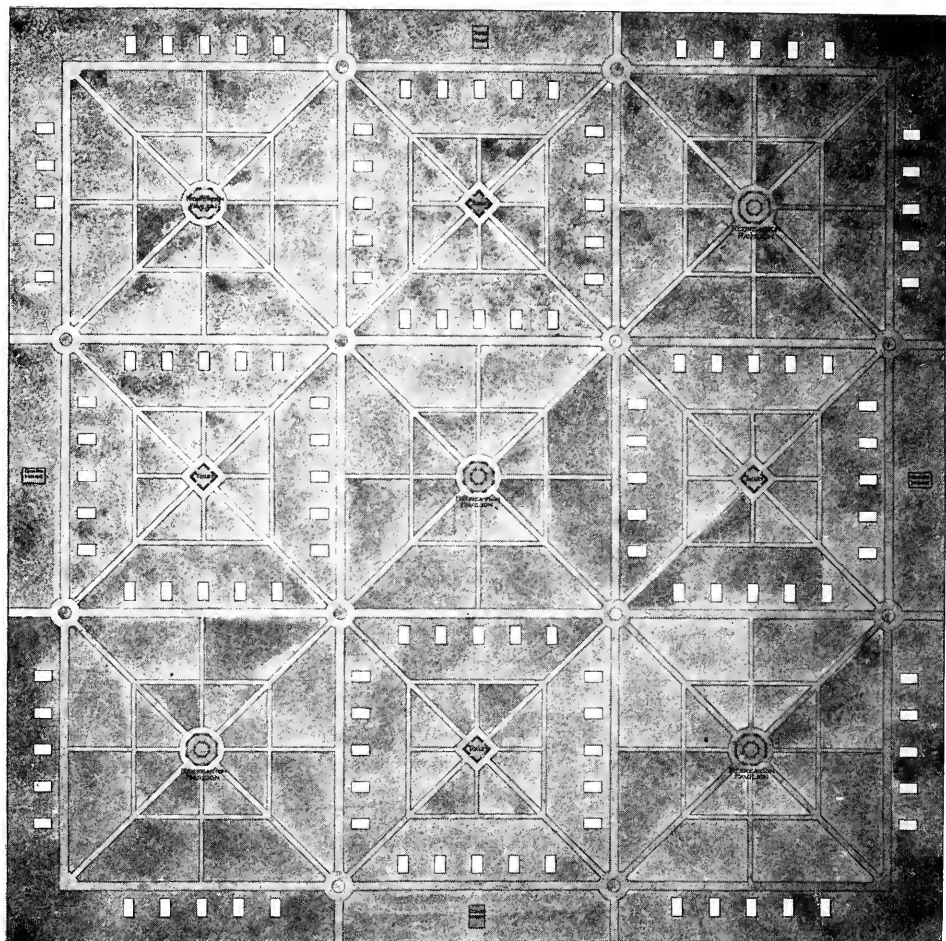
The amount of ground needed will depend on the capacity of the proposed institution, and also upon the character of the country immediately adjacent to the site. It should be sufficient to ensure the preservation of surrounding forests to the north and northeast and to prevent undesirable neighbors in the immediate vicinity of the buildings. It should, if possible, be sufficient to provide for walks for the patients, affording diversity of outlook without climbing and without leaving the property of the institution. It should be sufficient to enable the hospital to maintain a considerable dairy and to carry on the raising of poultry and also vegetable and fruit raising. These are needed both for reasons of economy and to provide healthful interesting occupation for such of the patients as are able to engage therein. I should suggest that for a hospital to accommodate 500 patients there should be secured if possible from 250 to 400 acres of land.

Fortunately, it will not be necessary for the city to construct expensive buildings for this purpose, except for such service

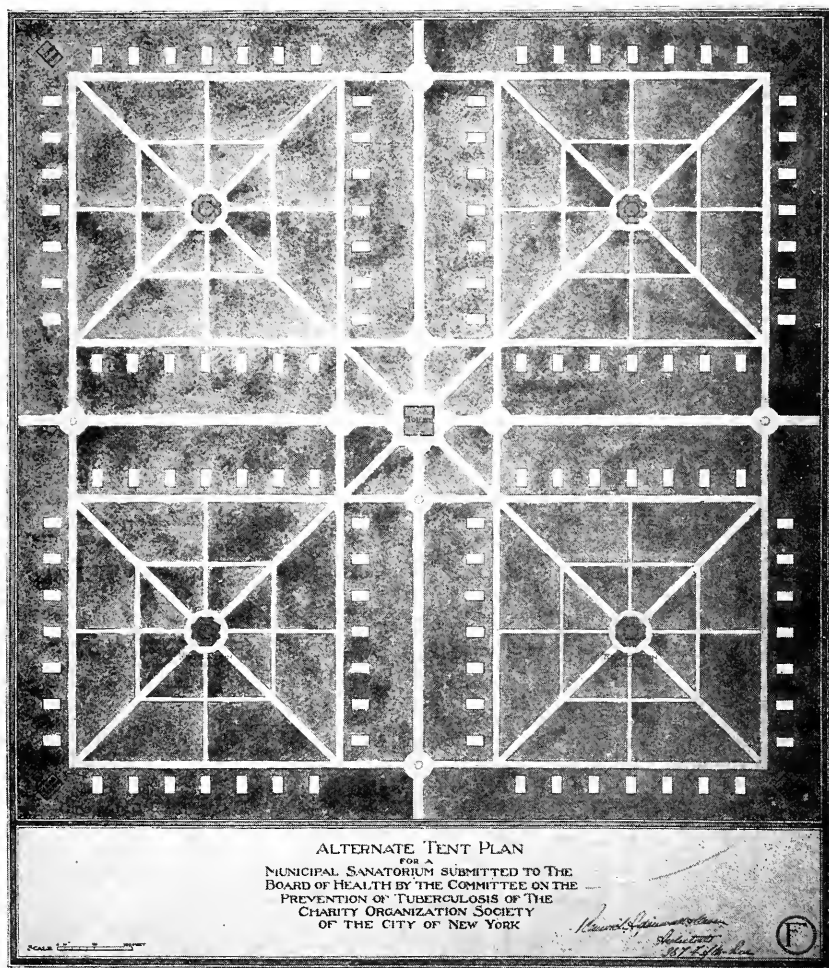


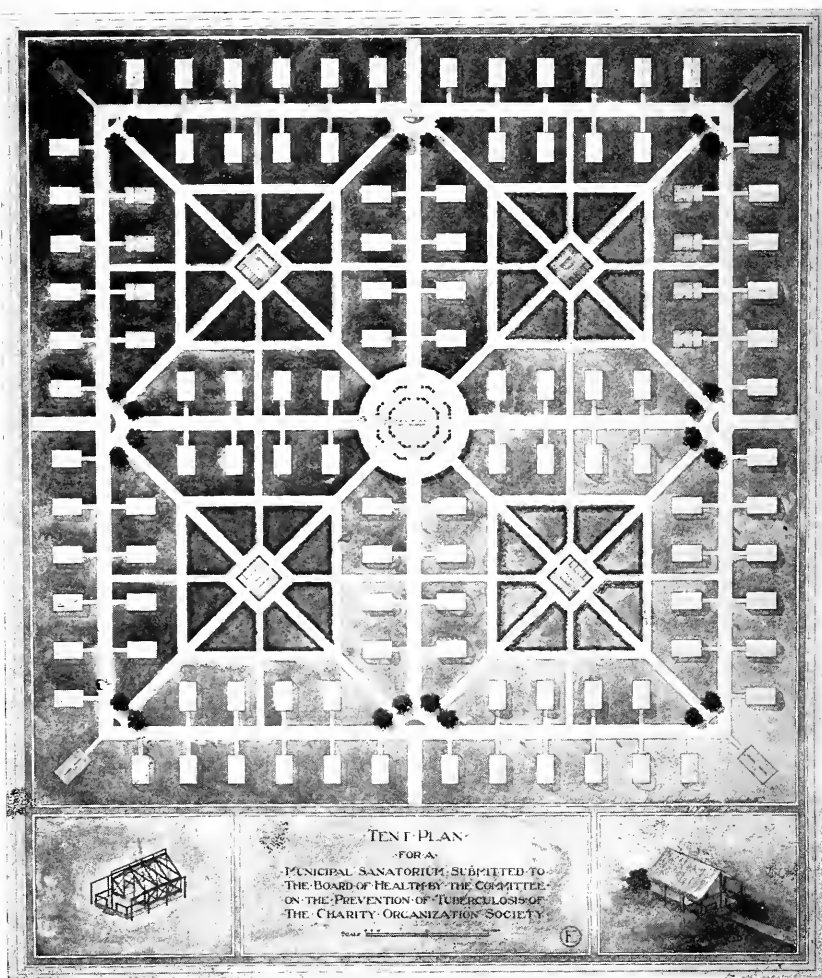


PERSPECTIVE VIEW IN PROTECTED GARDEN—LOOKING TOWARD DINING ROOM.



ALTERNATE TENT PLAN FOR A MUNICIPAL SANATORIUM.





buildings as power house, administration building, etc. Cheap wooden structures for some of the patients and tent cottages, such as have been constructed at the Tuberculosis Infirmary connected with the Metropolitan Hospital, Blackwell's Island, by this department, are inexpensive and are probably better suited to the needs of the patients, so far as dormitory purposes are concerned, than more expensive buildings. The cost of these tent cottages at Blackwell's Island, accommodating twelve patients each, is about \$90 for materials and \$30 for labor. I have received from the Committee on the Prevention of Tuberculosis, appointed by the Charity Organization Society, two sets of plans and sketches for a Municipal Sanatorium for Tuberculosis, one prepared by Messrs. Renwick, Aspinwall, & Owen, and the other by Messrs. Howells & Stokes. Each of these sets of plans is accompanied by a letter from the architects setting forth the general plan and arrangement of the buildings, the style of architecture, character of construction, and the probable cost. I believe that each of these plans is well adapted to the proposed purpose, though I believe that a smaller number of dormitories of a permanent character will be needed at the outset, and that a larger proportion of the patients can advantageously be provided for in tent cottages or in temporary wood structures. I submit herewith copies of each of the sketches and plans, and the explanatory letters by the architects accompanying the same. These are submitted merely as suggestions of the general character of buildings now favored for such purposes. Which of the two plans should be selected, or whether an entirely new plan should be prepared, or whether features of both plans should be favored, would naturally depend largely upon the character and immediate surroundings of the site selected.

#### PROBABLE EXPENSES FOR LAND, BUILDING, AND MAINTENANCE

So much depends upon the immediate surroundings of the site which may be selected, that it is hardly possible to give

even an approximate estimate of the cost of the land. I should presume, however, that such a site as is desired could hardly be secured for less than \$100 per acre, and that, in any case, it should not cost more than \$250 per acre, or for a total of 250 acres from \$25,000 to \$62,500, or for 400 acres from \$40,000 to \$100,000.

The cost of buildings and plants as estimated by Messrs. Renwick, Aspinwall, & Owen, according to the plans submitted by them, for accommodations for 480 patients is \$530,000; for accommodation for 325 patients, \$278,000; for accommodation for 286 patients, \$210,000. The estimate given by Messrs. Howells & Stokes of the cost of construction, not including grading, building roads, etc., on their plan, accommodating 500 patients, is \$407,000.

It is my own opinion that unless the site selected presented unusual difficulties, a satisfactory sanatorium, to accommodate 500 patients, can be constructed, complete, for the sum of \$450,000.

Inquiry of a number of existing institutions for the care of consumptives shows wide difference in the cost of maintenance.

The annual report of the Massachusetts State Sanatorium at Rutland, Mass., shows (page 16) that the average cost of maintenance per day during the year ending September 30, 1902, was \$1.42. This institution is devoted solely to the treatment of patients in the early stages of the disease, every effort being made to avoid the admission of patients who have passed the helpful stage. The average number of patients during the year was 177. The per-capita expenditure would, no doubt, have been considerably less with an average of 500 patients, as supplies could be bought more advantageously in larger quantities. This institution endeavors to provide the best possible diet for the patients under treatment.

The per-capita cost of maintenance at the Bedford Sanatorium for Consumptives in Westchester County, a branch of the Montefiore Home, with an average census of 134 patients, was seventy-six and eight-tenths cents per diem for the year ending September 30, 1902. This institution received about

fifty-eight per cent of advanced cases. During the three preceding years the per-capita cost varied from seventy-eight to eighty-one cents per day. The raising of produce on the farm assists in reducing the per-capita cost.

The Loomis Sanatorium at Liberty, Sullivan County, reports the per-capita cost of maintenance at the sanatorium annex, which is on the ward plan, as about \$1.21 per diem. This is based on the care of about thirty patients in the early stages of the disease. A larger number would reduce the per-capita cost.

The St. Joseph's Hospital for Consumptives, which cared for an average of 345 advanced cases during 1902, reports the per-capita cost per diem as eighty cents.

At Seton Hospital, with an average of 195 patients during 1902, the per-capita cost of maintenance was seventy-nine and three-tenths cents. This institution receives both incipient and advanced cases.

At the Metropolitan Hospital on Blackwell's Island the per-capita cost in 1902 for all patients, averaging 623 in number, tuberculous and otherwise, was seventy-four cents per diem. While the cost of the diet of the tuberculous patients at that institution is six and one-half cents per diem more than that of the other patients, the cost of nursing and of medical and surgical supplies is much less, so that the per-capita per-diem cost of the tuberculous patients at this institution is not far from seventy cents per diem. The actual per-capita cost of the tuberculous patients during May, 1903, was sixty-one cents per diem. This does not include light, and the cost for fuel was much less than the average cost of that item for the year. The majority of the patients are in a more or less advanced stage of the disease, but all are provided with such treatment as is considered by the medical authorities of the institution as best adapted for their improvement.

In view of the fact that the proposed sanatorium is to be for the treatment of cases in the early stages of the disease and as plenty of food, especially eggs and milk, is a necessary feature of the treatment, I should estimate the cost per capita

per diem at \$1.00, or a total for the year, for an average of 500 patients, of \$182,500. This amount might be reduced if sufficient land were provided to permit the carrying on of dairying, poultry raising, and vegetable and fruit raising on a considerable scale. In this estimate I have taken the term maintenance as including the cost of food, clothing, bedding, salaries, medical supplies, light and fuel, and ordinary repairs.

At the present time fully one-third of all consumptives now under care, in or near the city of New York, including the Sanatorium in Sullivan County and in the Adirondacks, are under the care of the Department of Public Charities at the Tuberculosis Infirmary on Blackwell's Island and at the King's County Hospital. The number of tuberculous patients in these institutions on July 1, 1903, was as follows:

Tuberculosis Infirmary, Blackwell's Island.....	391
Kings County Hospital, Brooklyn.....	60
Total.....	<u>451</u>

The Tuberculosis Infirmary on Blackwell's Island was opened on January 31, 1902, and received within a few months after its establishment all consumptive patients from the hospitals and institutions in the Department of Public Charities, and, with the exception of the patients in two small wards, all those in the hospitals under the direction of Bellevue and Allied Hospitals. Every effort was made to administer the institution on progressive lines and to afford such food; clothing, treatment, and care as would tend to the improvement of all patients whose condition permitted of improvement. The infirmary steadily increased in numbers until the capacity of the buildings was taxed to the utmost; to relieve this pressure and also to afford a larger measure of out-of-door life, seven tent cottages have been constructed during the past two months which provide at present for thirty patients. The construction of tent cottages is being continued, and by August 15th, it is expected that fully 150 patients will be thus provided for.

While the establishment of the Tuberculosis Infirmary on



Blackwell's Island is producing many important and highly satisfactory results, in securing the segregation of consumptives from other patients in the municipal hospitals, in the removal of a larger proportion of both early and advanced cases from the tenement-house districts, and in showing marked improvement on the part of many of the patients received at this institution, it has already demonstrated the fact that it is practically impossible, as it is also undesirable, to provide on Blackwell's Island for anything like the number who will certainly apply for admission and who should be received. Our experience indicates that there should be established, as is contemplated by the resolution adopted by the Board of Aldermen and approved by his Honor, the Mayor, another institution in the country, at a greater altitude, with a much larger site, and with opportunity for daily light employment, to which patients most likely to profit by such surroundings can be sent. This new institution should sustain such relation to the Tuberculosis Infirmary as will facilitate the freest interchange of patients, according to their condition from time to time.

The work of the proposed sanatorium is, perhaps, more nearly akin to that of the board of trustees of Bellevue and Allied Hospitals than that of any other existing board or department. The fact that the Commissioner of Charities is *ex officio* a member of that board would ensure co-operation between the new institution and the work now or hereafter carried on by the Charities Department. The Department of Health, to which cases of this disease are reported in the first instance, could refer such cases as its investigators indicate should receive sanatorium treatment to the trustees.

I therefore respectfully recommend:

(1) That the Board of Estimate and Apportionment express its approval of the establishment of a municipal sanatorium for consumptives of the general character of that herein described.

(2) That the Board of Estimate and Apportionment request the Board of Health to select a site for such sanatorium at the earliest practicable moment, and in co-operation with the

board of trustees of Bellevue and Allied Hospitals secure the necessary consents therefor.

(3) That the Board of Estimate and Apportionment request the board of trustees of Bellevue and Allied Hospitals to co-operate with the Board of Health in selecting such site and in securing the necessary consents therefor, and to establish and maintain thereon, when the use of such site has been secured, a sanatorium for consumptives.

(4) That an appropriation of the sum of \$30,000 be made, through the issue of special revenue bonds, to the board of trustees of Bellevue and Allied Hospitals to cover the cost of selection of site and maintenance during the remainder of the current year.

(5) That an issue of bonds to the amount of \$400,000 be authorized for the construction by the board of trustees of Bellevue and Allied Hospitals of a municipal sanatorium for consumptives.

All of which is respectfully submitted.

HOMER FOLKS,  
Commissioner of Public Charities.

July 15, 1903.

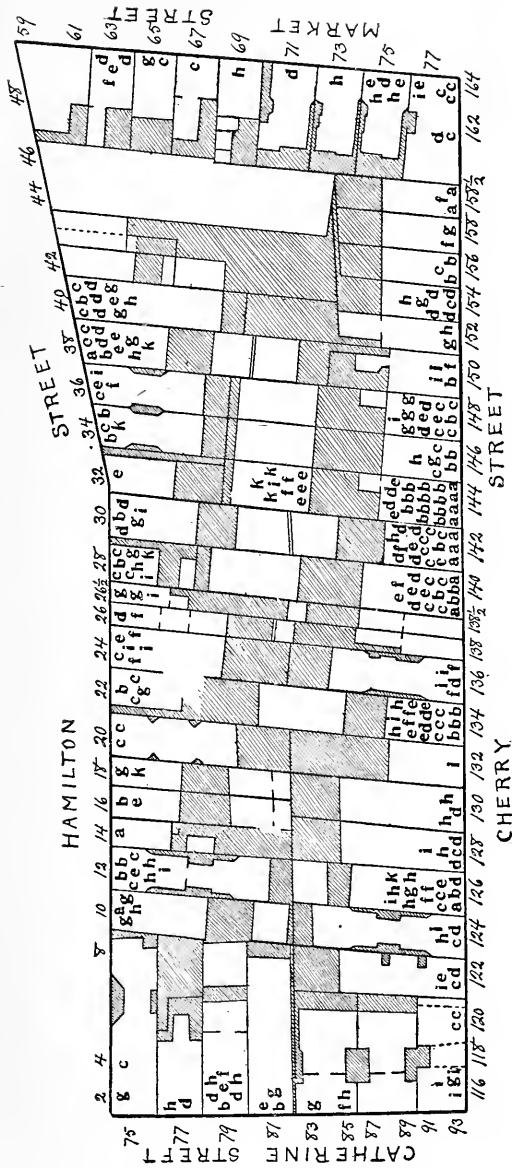
APPENDIX 16

THE PLAGUE IN ITS STRONGHOLD  
TUBERCULOSIS IN THE NEW  
YORK TENEMENT

By ERNEST POOLE

“ We must care for the consumptive in the right place, in the right way, and at the right time, until he is cured ; instead of, as now, in the wrong place, in the wrong way, at the wrong time, until he is dead.”—J. H. PRYOR.





GROUND-PLAN OF "THE LUNG BLOCK."

The shaded sections are courtyards and air-shafts. Each letter represents one case of consumption reported to the Health Department since 1894.

$a$  = one case in 1894.  $b$  = one case in 1895.  $c$  = one case in 1896, and so on to  $k$  = one case in 1903.

(As it is not possible from the records to tell whether a given case occurred in the front or rear tenement, all have been assembled in the front building, except in 144 Cherry, where there was not room).



## THE PLAGUE IN ITS STRONGHOLD

### THE PRAYER OF THE TENEMENT

“BREATH—breath—give me breath!” A Yiddish whisper, on a night in April, 1903, from the heart of the New York Ghetto.

At 18 Clinton Street, back in the rear tenement, a young Roumanian Jew lay dying of consumption. I had come in with a Jewish doctor. With every breath I felt the heavy, foul odor from poverty, ignorance, filth, disease. In this room ten feet square six people lay on the floor packed close, rubbing the heavy sleep from tired eyes and staring at us dumbly. Two small windows gave them air, from a noisome court—a pit twenty feet across and five floors deep. The other room was only a closet six feet by seven, with a grated window high up opening on an air-shaft eighteen inches wide. And in that closet four more were sleeping, three on a bed, one in a cradle.

“Breath—breath—give me breath!” The man’s disease was infectious; and yet for two long weeks he had lain here dying. From his soiled bed he could touch the one table, where the two families ate; the cooking stove was but six feet from him; the cupboard, over his pillow; he could even reach one of the cradles, where his baby girl lay staring frightened at his strange position: for his wasted body was too feeble to rise; too choked, too tortured, to lie down. His young wife held him up while the sleepers stared silently on, and that Yiddish whisper came over and over again, but now with a new and

more fearful meaning: "Breath—breath—breath! Or kill me; oh, kill me!"

Two years ago this man had come to America—one of the four hundred and eighty-eight thousand in 1901. He came young and well and hopeful, with his wife and their baby son. Two more had been born since then. It was to be a new country, a new home, a fresh start, a land to breathe in. "Breath—breath—give me breath!" He had breathed no air here but the close, heavy air of the sweat-shop, from six in the morning until ten at night. Sometimes—he whispered—he worked on until eleven. He was not alone. In New York to-day and to-night are over fifty thousand like him working. And late in the night when he left the feverish labor, at the hour when other homes are sleeping, he had come in through the foul court and had sunk into restless sleep in the dark closet six feet by seven. There are three hundred and sixty-one thousand such closets in the city. And this was his "home."

"Luft—giebt mir luft!" He spoke only Yiddish. The new country had given the Plague before the language. For the sweat-shop and the closet had made him weak; his weakened body could make no fight; the Plague came in and fed swiftly. Still on through the winter he had worked over the machine in the sweat-shop, infecting the garments he sewed—feverish, tired, fearful—to buy food and coal, to keep his "home" alive. And now, on this last day of life, ten times he had whispered to his brother, begging him to care for the wife and the three little children.

The struggle now is ended. The home is scattered. The smothered whisper is forever hushed. "Breath—breath—give me breath!" It speaks the appeal of thousands.

#### THE GREATEST OF PLAGUES: AN UNNECESSARY EVIL

This Plague Consumption is to be stamped out once for all. It has hung upon the earth for thousands of years. It has killed not millions but billions of men, women, and children; more than all wars and plagues the world over. And now of



the seventy millions in our country, seven millions must inevitably die of this scourge unless the present ratio be brought down. Each year it kills over a hundred thousand of our men and women, and most of these are cut off in the very prime of life. To women between twenty and forty-five it brings one-third of all deaths; to men between thirty and forty-five it brings thirty-two per cent. Most startling of all—to young men between twenty and twenty-nine it brings no less than thirty-six per cent. of deaths from all causes. It is a Plague in disguise. Its ravages are insidious, slow. They have never yet roused a people to great, sweeping action. The Black Plague in London is ever remembered with horror. It lived one year; it killed fifty thousand. The Plague Consumption kills this year in Europe over a million; and this has been going on not for one year but for centuries. It is the Plague of all plagues—both in age and in power,—insidious, steady, unceasing.

It can be stamped out. Its workings are no longer hidden. We know now that consumption is not produced by direct heredity—the tendency alone is inherited. It is produced by infection from living germs, coughed up, millions in a day. Ignorance lets these millions live, spat out on walls and floors and pavements, to float later in the air and so spread the infection. Darkness, foul air, and filth keep these millions alive. Sunlight has killed them in fifteen minutes; in dark tenement halls they are known to have lived two years. Darkness, foul air, ignorance, drink—these weaken men, women, and children, and so make them ready for infection. Then the germs, if breathed in, may bring pulmonary tuberculosis—consumption; or if swallowed, tuberculosis of the stomach or the intestines; or if brought in contact with a wound, tuberculosis of the skin or of the joints. These latter forms are most common in little children. They bring but one-fourth of all deaths from the Plague. Tuberculosis of the lungs is the one great form of the Plague to be fought above all others. It can be stamped out.

In New York City a strong beginning has already been made.

While the population has vastly increased in the last twenty years, the number of deaths from this cause has remained about the same. Far greater effort, however, is now called for. Dr. Hermann M. Biggs, Medical Officer of the Department of Health, has recently said: "The measures now in force are quite inadequate as compared to the importance and magnitude of the problem. The sanitary authorities, however enthusiastic and efficient, and the medical profession, however influential and numerous, cannot grapple with this problem unless they have the hearty support of the people." And he adds: "I believe that tuberculosis may be practically stamped out." This is said from years of wide experience. It is supported by science the world over. Experience everywhere has shown just what must be done. The time is ripe for the people to act on a tremendous scale. Not hundreds, not thousands, but tens of thousands are to be saved for New York City alone in these next ten years. They are to be saved by attacking this Plague in its stronghold.

#### THE STRONGHOLD OF THE PLAGUE

Its stronghold is the tenement. Statistics prove this the world over. They show in New York State that in cities of over twenty-five thousand—now swiftly absorbing young men from the country, so making the problem still more appalling—the death-rate from consumption is over twice the rate in smaller towns and villages. In the city it is worst of all in the tenements. In New York City to-day there are at least twenty thousand in the tenements who are suffering in some stage of this disease. It is here among the crowded poor that the Plague feeds fat on ignorance and poverty, in dark halls, foul rooms, dark closets. It is here that it shatters the home as it has shattered homes among us all. Here it fastens on the bread-winner, eating up the small savings, lingering on for months and even years, so making the greatest of human powers—Love—only a means of infection and death. It is from here that sweat-shop garments and wares of all kinds go

out infected to all classes of people. It is here that unceasing danger lies for the whole community.

### “THE LUNG BLOCK”

“The Lung Block” has well earned its name. It is bounded by the streets Cherry, Catharine, Hamilton, Market. It is close to the East River—to open air. It should be wholesome. For a month I worked through it with the help of those who know it best. I went through with health and tenement inspectors, as a settlement visitor one week, as a “fresh-air man” the next. I use this one block as a centre, not to prove, but to image what has already been proved all through the civilized world, to image the three great evils we must fight in the tenement. These evils are Congestion, Dissipation, Infection.

That the Plague spreads with congestion has long been proved beyond the shadow of a doubt. It spreads even faster than the crowd pours in. So it is in the block we have taken. It stands in one of the most congested wards of the most crowded city in the world, and this Seventh Ward is steadily, swiftly packing closer. Between 1890 and 1900, the density of its already crowded population increased no less than sixty-five per cent. Now it holds four hundred and seventy-eight humans to an acre. The Lung Block alone holds nearly four thousand, not to mention dogs, cats, parrots and one weakened old monkey. Of the humans, some four hundred are babies.

It is a block packed close with huge grimy tenements; these tenements are honeycombed with rooms; these rooms are homes for people. To squeeze in more homes, light and air are slowly shut out. Halls, courts, air-shafts, are all left cramped and deep and sunless.

It is a block of a thousand homes. Through halls, in rooms, on stairways, in courts, in shafts, and out on fire-escapes, are sprinkled the four hundred babies. At the age of two they are found alone in the street, already imbibing its deep, muddy wisdom. So this muddy street overflows into the home. It

is hard for the home to keep wholesome and pure. Things and people—good and bad—have only partitions between them.

In a block so congested the Plague spreads swiftly. In the past nine years alone, this block has reported two hundred and sixty-five cases. From doctors, druggists, and all others who know, I gathered that this is but half the true number.

In a block so congested dissipation comes easy. Foul air, darkness, wretched surroundings—these work on the home by day and by night. Here a thousand homes struggle on, while hundreds yield and sink and so pollute the others. So come squalid homes and wretched meals. So comes the humorous, shattered old chap who told me, "I aint never sober but when I gits out of bed." So come hundreds of others, men and women, young and old; drunk, bestial, vile, forever steadily sinking. "Hard drinking triples susceptibility to consumption." This is seen most of all in the Irish; hence among the Irish the death-rate from the Plague is twice that of any other white nationality. The Jews, with their strict habits, their dietary laws, and a certain standard of cleanliness enforced by a rigid religion, show the lowest death-rate of all, though this is rising as they become tenementized. At present, the Lung Block has only Jews on the Market Street end, and among them we found hardly a case of consumption. The body of the block is packed with Irish and Italians, and a sprinkling of twelve other peoples. All these image best the dissipation, the shattered vitality which eats into savings, starves the home, then gives the Plague easy entrance, and makes it a constant danger to all in the family.

I give here but a few brief tales among many. In a tenement old, vile, infected, one of the worst on the block, an Italian lived some two years back. He had a wife and three little children. They lived in one room and a closet. They lived on four dollars a week. To make a home wholesome here means unceasing struggle. His wife gave up and took to drink. The man struggled on. He worked hard to support his babies, but it was a wretched home to come to at night.

Even the neighbors said so. The house was infected, and against its infection the home gave no protection, but only wretched food, wretchedly cooked, for the tired man and his little children. The man took the Plague. He worked on. Friends tried to make him stop. "No! Me die not yet at all! Me gotta bringa de grub to ma chil'." This feeling is as old as the hills. He struggled on. One afternoon he had a hemorrhage at work, and was brought home on a shutter. The "home" broke up. I could find but one more item. The baby girl died last year of the Plague—tubercular meningitis—over on Randall's Island.

Not far off lives a German family, a mother and five girls, the oldest sixteen, the youngest four. The father drank, took the Plague, and died. The mother took it from him. Of the hundred and thirteen dollars life insurance, she spent ninety dollars on his funeral. Then the starving began. The girl of sixteen lived three months on bread and tea alone, working each day at four dollars a week in a factory, pushing a heavy treadle from six in the morning until seven at night. She had worked so since she was twelve. "She aint never seen the country," said her little sister, who loved her. She went to night school always. She said she "meant to be somebody." She took the Plague in the winter, when coal had gone up, when the sleepless nights grew freezing cold. It was a brave fight, but it is over. I had her examined. She is hopeless. She knows now what the cough means when it shakes her thin, hollow chest; and her eyes, when the others are not looking, have that pitiful, hunted look which young eyes must ever have when suddenly meeting death. She had "meant to be somebody"; but her father drank.

Other vice is thick in the neighborhood. Among its victims, with no health, no love, no aid behind them, the Plague makes fearful havoc. "Not worth the bother," "I know a dozen but they aint worth helping"—so I was told again and again when seeking for patients whom country air might cure. Near by, on South Street, stands a house of ill-fame with a tiny attic overhead, reached by a ladder. In this place a consumptive,

a woman, lay three months cursing life and waiting for death. Just before the end, she was brought down the ladder one night like a spectre into the brothel, and so out into the ambulance. Thousands like her have been sick of this Plague in New York. How many have infected their patrons?

In one terrible house on the block lived a woman of ill-fame who had the Plague and struggled on—as a midwife—for a year.

But in this block the good outnumber the bad eight to one. In my month of work I met some of the kindest good people that ever lived. Hundreds of homes are doing their best; and yet even these homes cannot be wholesome. The innocent suffer. I will give only one brief tale.

It is a story of love—Irish love. They had been lovers for forty years, ever since the wedding back in the sixties. Even now their tender devotion was the talk of the block. They were poor and had one room with a closet in a house called “The Bucket.” In this house of homes the saloon below has for convenience a side door opening into the hall. In nine years the house has reported fourteen cases of the Plague. The real number must be over twenty. Foul air, darkness, ignorance, drink—all are common here. But our old couple drank not a drop, and their rooms, I am told, were neat as wax—useless cleanliness, when halls and stairways are all foul, infected, and black as night. The old wife took the Plague. For one long year she lay growing steadily weaker. By day the young people came often to sing and sew in the room with their cheery old friend. By night, her husband, a watchman on the dock, was away from six until seven the next morning. He was sixty-five and could get no other work. When friends spoke of the hospital, both the old people broke down completely. It was never mentioned again. She kept so cheerful always that he began hoping she might get well. He even thought so one cold night just after Christmas, as he ate his supper while she lay in the closet behind. She kissed him good-night and was left alone. In the morning at seven he came back. Then the woman next door heard a low, shaking



A "LUNG BLOCK" RESIDENT.



A "LITTLE MOTHER" AND HER BABY IN A CORNER OF THEIR ONLY PLAYGROUND.



cry. She found the old man sobbing by the bedside. For his wife was dead.

So the sober and the drunken, the pure and the foul, the well and the sick, are all packed close and mingle. So lungs are made ready for the Plague.

So, too, death overflows in the tenements. We have seen how congestion helps to bring drink. We have seen how both together make blood grow thin and lungs grow weak. To the lungs so weakened, congestion now brings constant exposure. By the most careful scientific proof we know that the Plague can lodge for years in tenements. When these infected tenements are crowded and dark and filthy; when winter keeps thousands packed close inside; then they can make appalling records of suffering and death. Of the two hundred and sixty-five cases reported on the block, one hundred and four came from the six old tenements alone.

There is one called "The Ink Pot." It has front and rear tenements five floors high, with a foul narrow court between. Here live one hundred and forty people. Twenty-three are babies. Here I found one man sick with the Plague in the front house, two more in the rear—and one of these had a young wife and four children. Here the Plague lives in darkness and filth—filth in halls, over walls and floors, in sinks and closets. Here in nine years alone twenty-six cases have been reported. How many besides these were kept secret? And behind these nine years—how many cases more?

Rooms here have held death ready and waiting for years. Up on the third floor, looking down into the court, is a room with two little closets behind it. In one of these a blind Scotchman slept and took the Plague in '94. His wife and his fifteen-year-old son both drank, and the home grew squalid as the tenement itself. He died in the hospital. Only a few months later the Plague fastened again. Slowly his little daughter grew used to the fever, the coughing, the long, sleepless nights. The foul court was her only outlook. At last she, too, died. The mother and son then moved away. But in this room the germs lived on. They might all have

been killed in a day by sunlight: they can live two years in darkness. Here in darkness they lived, on grimy walls, in dusty nooks, on dirty floors. Then one year later, in October, a Jew rented this same room. He was taken and died in the summer. The room was rented again in the autumn by a German and his wife. She had the Plague already, and died. Then an Irish family came in. The father was a hard, steady worker, and loved his children. The home this time was winning the fight. But six months later he took the Plague. He died in 1901. This is only the record of one room in seven years. In the rear house is another Plague room—on the ground floor to the right of the low, narrow entrance. Here, in '96, lived an old Irish hat-maker, with his wife, his small daughter, his two sons. He was housekeeper. He took the Plague, worked a year or more there on his hats, then died. The cough came on his wife soon after. She suffered long, weary months, only to see at the end her young daughter begin the same suffering. The mother died. The home was shattered. The girl was taken away by her aunt, and soon followed her mother. The two sons died of the same disease, spreading it out into other tenements. So by this room one whole family was blotted out. This is not all. When the next housekeeper came to this same room with his wife both were strong and well. The man took the Plague in '99. He still fought for life when all knew he was hopeless; he still lived on when he could not rise, could barely speak, but only lie alone in one of these closet bedrooms. There are no fewer than twenty such rooms in this rear house—windowless, six feet by eight. That winter of 1900 brought the memorable blizzard. While it was raging, a settlement visitor came to this room, and found the water-pipe burst, the room flooded. The plucky little wife had carried her husband upstairs on her back. A few days later his struggle was ended. The wife is still here.

Infection comes not only from the room, but as well from halls and stairways. An old Italian, a hopeless victim, sits out on the steps in front, all day long in the sun while the children play around him, and all through the evening with men and

women beside him. His cough never stops. The halls behind and above are grimy, offensive, hung heavy with cobwebs, and these cobwebs are always black. The stairways in the rear house are low and narrow, uneven, and thick with dust piled up in every nook and corner. This dust is virulent with disease. Through the years a score of consumptives have lived here, groping their way each night up the stairways, stopping on the landings to catch their breath and cough, and so spread the infection. But for light trickling through grimy panels in doors, these halls are forever dark. It is in halls like these that the germs can live two years or longer. It is with halls like those outside that one clean room cannot bring safety.

This house is a danger not only to those who live in it. From here the Plague is constantly spreading out all over the city—to rich and poor alike. To show this danger, I give the few tales recorded here from the many in the past.

In this rear house lived once an Italian family. They, too, had little children, and so were ambitious, and gained a name with employers for always doing good work. Their work was sewing men's garments to be sold later in large clothing stores. The work was all done in their rooms. By working fourteen hours they could make sixty cents each. In early winter the man gave out. His weakened body could resist no longer the ceaseless infection. He took the Plague. He kept on working. The air was close and heavy. The windows were never open, for in freezing weather fresh air costs coal. His disease for months was constantly infecting the garments he worked on. He worked until the very end.

On the floor above, the right-hand room in the rear has one closet bedroom six feet by seven. An Irish boy of seventeen died there of the Plague in '96. Soon after, a man of forty-three moved in. He slept in the same closet. One year later I find him reported. His disease was slow. He kept on for two years with his work. His work was handling fish in the market.

In the basement lived another man who made hats. He

died of the Plague, and soon after the basement became a pickle factory. So it is to-day.

In the front house, high up in the sloping roof, are the small dormer windows of an attic. An Italian woman, already sick with the Plague, moved in some years back, with a wild, carousing crowd of companions. Three weeks of this brought the end, and she was taken off in the ambulance. The attic is now offensive beyond words. It is packed with some twenty Italians—men and boys, one slight girl of sixteen, and a baby. The men bring in sheepskin rugs and by some process here make them snowy white, to be sold up-town from house to house, where they bring good prices. So the Plague spreads.

#### PLAGUE SPOTS IN OTHER CROWDED QUARTERS

This is infection for but nine years in one tenement. Not here alone, but from every crowded quarter, these stories roll up with a terrible force. I give briefly the stories of three Plague rooms. Up on West Eighteenth Street is one room in a rotten old wooden tenement. For years it has held the same dust in its corners, the same grime on its ceilings, the same filth on its walls. Sanitation here is unspeakable. The Plague entered by chance a few years back. It was no chance that made it stay. Since then in this one room there have been five deaths from the Plague among those who, one by one, have come here to live, who have been weakened by its foulness, then infected by its germs.

Near by, on Fifteenth Street, are two rooms in a basement. These are damp and close and old with disease. The bedroom is wholly dark. Here the Plague came in three years back. A man died. His family moved out. An Irish family came next, in the winter—"all strong and well," the dispensary doctor said. But human beings to keep strong need more than a foul, damp basement. Bodies grow weak; and if then the germs are breathed in they may lodge and spread with appalling swiftness. The husband took the Plague. In two months he died. The family, now weak and sickly, moved

out to go on charity. A stout German moved in with his wife. Six months later he took the same disease. They moved away. An Irish widow came next. She was the strongest of them all. The four little children were lively as crickets. Soon they began to change; their mother began to cough. Now she is dead and they are scattered.

The third "home" is but a few blocks away. The family moved in some three years back. They were Americans—a young man of thirty, his wife, and five small children. One year later he had taken the Plague and died. His wife slept in the same back-room. She died of the Plague six months later. Her old father and mother went there to care for the children. He slept in the same back-room. He died of the Plague in 1902. His son came to help support the others. He slept in the same back-room. Two months ago he died of the same disease. Of these cases not one was reported as consumption. The room has not once been disinfected. The same dirt, the same grime, the same germs are undisturbed. The old grandmother is there now with the children.

#### THE SERVANTS OF THE SLAYER: DARKNESS, FOUL AIR, IGNORANCE

So in these Plague strongholds infection is aided by darkness and foul air. Of these two evils—darkness and foul air—there are many causes.

One cause is the air-shaft. Through the city are thousands of tenements with air-shafts less than five by five. Rooms opening on these are technically "dark." Add these to the rooms wholly dark, and we have in New York three hundred and sixty-one thousand. On the Lung Block alone are four hundred. The Tenement House Department is ordering the landlords all over the city to open up one side of each dark closet, so making a huge window into the room they belong to, that more light and air may thus come in. There are three hundred and sixty-one thousand to be changed. Meanwhile the worst Plague strongholds on the block all have these rooms

and these air-shafts. Shafts like these are no places to breathe in; as one old Irishman said: "They do for wan mouthful of air"—but no more. The sunlight never enters.

I know a winsome little chap five years old, and his name is Yutzi Romeo. Two years back his father came over from Sicily, and eight months ago he sent for the little wife to come and bring Yutzi. I found them in a rear tenement on Hamilton Street, one where the Plague has made a fearful record. They lived on four dollars a week, in a room and a bedroom closet. Their front room looks into a court five floors deep—a court so narrow that a short iron bridge connects the two roofs above it. The closet looks on an air-shaft. This shaft is two feet wide by fifty deep; foul with garbage, decayed refuse, old clothes, and filth. The dark closet has a window high up, small and grated, that the people across the shaft may not crawl in. What a place for a little child to be sick in! Here night after night through the winter, while the man worked in the other room on sweat-shop garments, the little mother had sat up listening to the cough that grew deeper and more choking, watching the fever grow worse, the little body grow thin; frightened more each night as the neighbors told her of the Plague and what it could do. She, too, was ignorant. She bought a cheap print of the Madonna, set it up in the dark closet, and prayed as even ignorant mothers can. She had tried two Italian doctors. I tried two more. "Consumption—hopeless," said both. Then we went up-town to a great specialist on lungs—and kindness. He said at last: "Malaria and bronchitis—will almost surely develop tuberculosis in such surroundings, but now his case is hopeful." So the chance was seized, and one of the thousands was taken in time.

There are hundreds of other shafts as foul, hundreds of other little children as tender, hundreds of other mothers who love but do not know.

A second cause of foul air is that thousands of tenements have no skylights. All the hot, fetid air from the halls, the stairs, and the open rooms below rises up, finds no way out, and settles in the hall and rooms above. Time and again,

going with the tenement inspector, I felt a breath of bad air as we reached the top hallway. This complaint, "no skylight," was sent in for almost every house on the block where the Plague has its stronghold.

I remember one of the worst, another old house on Hamilton Street, with eleven cases recorded in nine years. I went in one night at six o'clock. Outside was broad daylight. I climbed five dark flights, felt the heavy, foul air of that cramped top hallway, and, groping my way to a door, I knocked and entered. A young Irishman of twenty-five lay fevered, smothered, breathing hard, in a tiny room stifling hot. His was an advanced case of the Plague. Close beside his lounge, on a soiled pillow on a chair, lay his baby girl five months old, with eyes wide and frightened, sick with pneumonia and the measles. The doctor who kept the drug store had come up once to see her. The wife, a thin, pale girl of twenty-three, was out office cleaning. She would come back at eight o'clock, worn out, to cook and clean and nurse. Two children on their floor had died that week of the measles. They had not been reported. The man kept the windows all shut for fear of his baby. So they lay side by side—white, weak, fighting for every breath. And every breath held the germs of the Plague.

Below, on the ground floor, lay a man of twenty-nine, a hopeless case, a beast from drink and worse. His room was a pen of filth, its foul, infected air mingled with that of the equally infected halls and stairways, and this air rose up to the father and his child. So it is with thousands.

There are many other causes of darkness and foul air. All these I can show best by a story of a case in "The Bucket." In the fourth floor rear lived an Italian and his wife, with five small children. The dark man was a hard worker, from daylight until long after dark, sewing neckties. He took the Plague in a tenement near by, which is called "The Morgue" because in the past fifteen years it has held twenty-eight cases of the Plague. They left this place and moved up-town, but could not bear the expense and so came down to this tenement on Cherry Street. The man was sick three years, still working

when he could—infecting the ties he worked on. At last he stopped and went to the hospital, but soon left and came “home” to die. It is this love of wife and children that brings thousands of deaths from the Plague in the tenements. The man died in the spring of 1902. But he died too late.

This family of eight had lived in three rooms. One was a dark closet, windowless; next came the kitchen, also dark; and third, the “best room,” crowded with old plush furniture, with two windows looking into the court behind. Here the children lived with the father, while he slowly died.

Here the air was forever foul. From their windows the court looks like a deep pit; brick walls rise up on all four sides. It is crowded below with school sinks, and these we found unspeakably filthy, with three weazened little chaps playing hide-and-seek between them. The ground floor of the house is a pork shop, where huge cauldrons of pork fat boil day and night. Even from the roof above we noticed the sickening odor. Inspecting the cellar we found a strange odor of gas. The floor as usual was damp, uneven earth. A huge sewer main ran along one side. In this we found three gaps the size of your fist, and two rents, one eighteen inches long; hence the odor, which mingled with the other odors in the pit outside.

This air came in the front room, through the dark kitchen, into the closet behind. In this closet, seven feet by nine, slept four of the smaller children. Rosalie was a gentle little girl of seven. At night she slept in this closet. By day she watched three still younger brothers and sisters while her mother was out scrubbing. You could see her grow paler each day, so I am told by a friend from the settlement near. It was then her father came home to die.

That was a terrible month. The mother never let the four younger children go down to the street below, where you can see men and women drunk at any hour, where, on the one block, on this one side of the street alone, are eight saloons and several houses of ill-fame. So they used to play most often in the hallways. These we found so dark that it took the inspector’s lamp to show up the filth on floors and stairs,

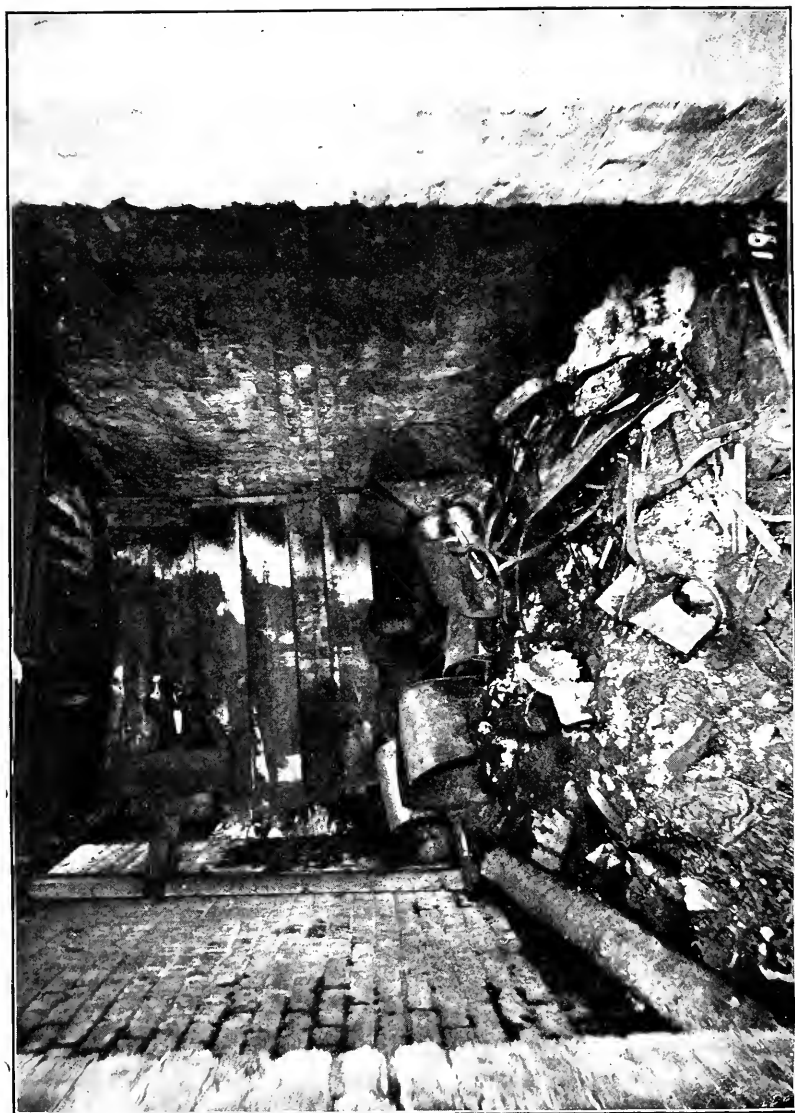




“ IT IS IN HALLS LIKE THESE THAT THE GERMS CAN LIVE TWO YEARS OR LONGER.”



AN AIR-SHAFT SIX FEET LONG, TWELVE INCHES WIDE, AND SIX FLOORS DEEP.



“HALLS, COURTS, AIR-SHAFTS, ARE ALL LEFT CRAMPED AND DEEP AND SUNLESS.”



"THERE ARE OVER 361,000 SUCH DARK ROOMS IN THE CITY."

the broken plaster, the grimy streaks and patches on walls and ceilings, the ideal dark hall where germs live two years and longer.

The father died. The Italians spend every cent on their funerals. So it was here. Then came even closer living—and then the hot weather. The four brick sides of their pit grew too hot to cool off at night. All night you could hear the coughing from two consumptives on the floor just below. “The Bucket” grew terribly thirsty; noises grew louder and more prolonged. Foul air arose from the cellar, the pit, the halls, the closet. Rosalie took the Plague in one of its most loathsome forms—intestinal tuberculosis. She sank swiftly. A visiting nurse was summoned, and found the child lying on two chairs near the two open windows. “She was a pitiful sight, only skin over bone.” She could barely take medicine. She could not even turn over unless you helped her. So the weeks dragged on while the foul air steamed up. In the end of August Rosalie died.

#### THE WARFARE AGAINST THE PLAGUE

Congestion, Dissipation, Infection! The war against them will be fought on two lines, Prevention and Cure.

Prevention is slow. Foul air, darkness, and ignorance—these must be steadily changed for fresh air, cleanliness, knowledge, and light. It means years of unceasing work ahead: unceasing work by the new Tenement House Department which in one year has made such a splendid beginning; unceasing support of this work by the people of New York; unceasing appropriations; unceasing belief that to save thousands of human lives is cheap at any cost. It means millions of dollars to be spent in new parks, in playgrounds, in public baths. It means big-hearted brotherhood. It means self-defence.

Cure need not be slow. Those sick of the Plague must now be treated “at the right time, in the right place, in the right way, till they ’re cured”—not as before, “at the wrong time, in the wrong place, in the wrong way, till they ’re dead.”

In Germany every laborer and servant is obliged by law to become insured against sickness, accidents, and old age, the companies being controlled by the government. Hence, as soon as the Plague's first symptoms appear, men are quick to find relief at one of the many sanatoria. There, in 1897 and 1898, eighty-two thousand insured men and women were treated, and of these seventy-one per cent. left with strength and hope won back. So they have now learned to hope; and so by going in time are lastingly cured. Here in America men wait on until unable to work, then see a doctor, and at last are reported hopeless. The cry, "The hopeless report, the hopeful don't!" comes from all the men and women who are striving to push this tremendous campaign. I give now the reasons for this cry.

#### FACTS TO BE FACED IN NEW YORK

They don't report in time because the places of cure are not yet inspiring trust and hope. Go to-night through this same block. You will find no one sick. They must know you first. What is your business there, how can you help? In my week as "fresh-air man" I found many cases before unseen—because I could help. The city has even now room for but a few hundred consumptives. It is well known that most of the cases it takes are already hopeless. True, a few are cured, for a right beginning has already been made. On the East River islands are city hospital camps which are doing excellent work. At Seton Hospital a few more are cured each year. This is just the beginning.

It must take time and widespread endeavor to kill the vague superstitions that have grown up between the tenements and the city hospital. "The black bottle" I have heard of again and again as containing a fatal drug, which the doctors are believed to give when tired of free patients. So thousands are afraid and don't report.

They don't report in time because thousands feel that the Plague is absolutely fatal. On the Lung Block two hundred

and sixty-five have been sick; hardly one has been cured. Those sick feel the Plague fastening slowly. Many make up their minds to die, and wait, working.

In the house where Rosalie died I found a brave little woman working, waiting with her daughter eight years old. They have a room looking into that same foul pit; a dark kitchen behind it, where the gas was lit when I went in at noon; and behind, wholly dark, a bedroom. In this room her mother died of the Plague eighteen months back. Her father and brother both died of the Plague in a house quite as bad a few doors up the street. Her husband was already stricken. He drank. He had left her. His mother and father, his sister and two brothers, had all died of the Plague over on Hamilton Street. And now in the last five years her two babies had died from another form of the same disease. "What 's the use? What 's the use?" While her mother was sick she was working through the summer in a factory from 7.30 in the morning until 10.30 at night. I have seen such places in summer. A hasty swallow at noon and six o'clock; between, only desperate haste. "The steam was the worst," she told me; "it was awful—awful—awful!" The few hours at night were by the sick mother. In a few months her weakened lungs, too, were infected. The Plague fed with terrible swiftmess. In eight months she lost eighty-five pounds—but still worked on. At last, too weak for the factory, she worked from seven until nine and again from five until eight, at office cleaning. So we found her and had her examined. The doctor said there was still a chance. And because the girl of eight was pale and delicate, we offered to send both for three months to the country, where medical care could be given. But she said: "It 's got to come anyway, an' we 'd get homesick for the block, so I guess we 'll stay."

"It 's got to come!"—this is the belief of thousands. This belief can only be destroyed by hundreds of cures to be begun in 1903.

They don't report in time because hundreds are insured in small companies, and this insurance is all lost to the patient's family if his disease be reported as consumption. It is for this

cause that thousands have died of the Plague, begging their doctors to call it pneumonia or bronchitis. Doctors, too, are human, and the immediate needs of their patients obscure the importance of accurate records. So thousands have died in years past and the records, startling as they are, have not yet told the whole story.

They don't report in time because they want to live to-day, not after six months of tedious, doubtful recovery. This is most true of the Irish. To-day is worth a score of to-morrows. Just here the quack steps in with his "Sure Cure for Consumption." I know one drug store on Catharine Street where the druggist counted from memory eighteen who had come to him regularly for these patent cures. These cures contain alcohol, which brings relief to-day but relapse to-morrow. Their written promises are vastly more attractive than the vague hopes held out by the doctors.

The druggist told me of one tall, genial young Irishman, barely twenty years old, who came every week for three months in the winter, growing steadily more emaciated, his eyes more hopeless, his jokes more feeble, his smile more forced. At last he disappeared. So it has been with not hundreds but thousands here in the city who have spent their small earnings, their small hope, in these cheap deceptions, have lost faith in all medical aid, and so despairing have died.

One reason why the Plague makes such slow progress among the Jews is their constant effort to cure it in the right way—by fresh air, by right and abundant food. I know of one family with five small children where every cent was scraped and saved from the push-cart earnings in the Ghetto to send the father back to Germany to a sanatorium there. This happens, I am told, with hundreds in our Ghetto.

Up on Second Avenue lives a Polish widow. She has two babies, two and three years old, and she has taken the Plague. She is only an ignorant mother. Being ignorant, she cannot see the danger, nor the use of carbolic acid. Being a mother, she sleeps with them, feeds them, loves them. To leave the wretched small room, the unchecked fever, the aching weariness



ness of sleepless nights, to leave all this—and the babies—she has twice refused. And up on East Sixteenth Street there lives a Russian sick of the Plague. All day and long into the night he sat sewing garments in the one small room. His little daughter of twelve worked with him. Now she, too, has taken the Plague. Again and again have friends tried to give her these summer months in the country. But her father is sick and alone. So she, too, stayed on—and now she is dying.

They don't report in time because—and this last reason is strongest of all—they won't give up. Life in the tenements is bright and full of color if only you keep up. Lose your grip, and things seem to pile up in a day and bury you under. All who watch the tenements will tell you this. "Don't lose your grip!" is the motto. Charity experts agree that here in America the dread of going on charity is generally greater than in any other country of the earth. And so they fight on, because plucky, and because they have seen their Plague-stricken friends go to the hospitals only to die. They keep clear and won't believe in time. They fight on blindly. I remember case after case of brave, unceasing effort, of kindness, devotion, and death. Most of it is blind for all the reasons I have given, and because there is hardly a case that can be cured without large expense of money.

I am glad to tell of one case where the unaided struggle was won, in a rotten old tenement on Cherry Street. Husband and wife, Danish, they had lived on the block for sixteen years. The man was pronounced hopeless last December. Then his wife took charge. Years ago, as a nurse in the English army, she had fought day and night the fearful cholera plague in India. She was iron-strong in mind and body and soul. For three days, she told me, she "talked the Plague right out of him." First—*all doctors were fools!* Second—*he was a coward!* Third—*he must get well!* She had sent to Denmark for a wonderful herb which her old mother had used, and for some Danish sweet oil. She brought out now every cent of her savings. Milk and eggs, meat soups and oil—all these were given constantly. He was moved to a lounge

right under the open windows. He was never left alone. The Plague was talked out, oiled out, herbed out. Perhaps the milk and eggs and the unceasing devotion did it. He gained twenty pounds, and is now again out working—ten hours a day cleaning out manholes.

This success is but one among thousands of failures. Across the street, in "The Barracks," a woman told me that for weeks she had been kept awake in her closet bedroom by an unending cough that came through the thin partition beside her. It was some time until I found the one who coughed, because she worked all day. She was a German widow whose husband died of the Plague last year. She has three children, one a baby in the day nursery. She comes home only late at night. At first she was afraid to be examined, and it was only through the kindness of the doctor at the mission near by that this strong fear was overcome. The woman had the Plague in the very beginning stage. She might easily be cured. She was told she might take her baby and youngest boy to the country to be boarded free all summer. The boy of fourteen was to be kept with friends until she came back in the fall. She refused. She thought work was too rare to be given up; what if she could find no other work in the fall and so go on charity? Anyway, she was n't yet sick. She would work on, she said, until she got sick in bed, and then she would think of being cured. No arguments from visitor, doctor, or friends could change this decision. "Keep your grip!" It is the motto of America.

#### WHAT THE SITUATION DEMANDS

The right time, the right place, the right way, are all demanded. The sick will never report at the right time until they believe they can be healed; until they know we have the right ways and the right places to cure them. These right places must now be made.

Millions must be spent—because thousands of human lives will not be saved for less. Most doctors agree that every consumptive should be taken outside the city to sanatoria. All

doctors agree that there are thousands in the most wretched of our tenements who cannot possibly be cured in their present foul surroundings. As one has said: "It is open air, and open air all the time, that counts." He adds: "The Plague is not cured by quacks, by patent medicines, nostrums, or other secret remedies; but solely and exclusively by scientific and judicial use of fresh air, sunshine, water, abundant and good food; milk, eggs, meat, vegetables, fruit; and by the help of certain medical substances when these hygienic and dietetic means do not suffice in themselves to combat the disease."

The farm cure plain and simple is not enough. A friend of mine sent one young Russian to a farm last March to be cured by Nature. The Plague was only beginning. The time was right; the place was wrong. At the end of a month a series of letters began, of which I quote bits that tell the whole story: "i am improving very nice—i aint coughing no more—i am getting fat—i sleep good and i have a good appetite to eat—i gained sixteen pounds—the country doctor here says the only thing i Need is *plenty of exercise work all day plowing and planting on the farm*—so i do. when i earn enough i will bring my wife and baby—it is a regular paradise—i will live here always—the faivers you have done to me will never be forgotten." Two weeks later: "you write me not to work hard. you no as long as i am harness up i must pull—my wife and baby are here and feel good—i will answer your questions—i cough again bad—appetite no good—sleep no good—sweat nights no—fever yes." Ten days later: "i am coughing something terrible werst i ever did." He died.

He should not have died! And now others like him must live. We must have the *right* places; where not in summer alone but all through the winter the sick may have the *right* use of fresh air and sunshine; where the *right* food may be given in abundance; where doctors will not advise "heavy plowing all day"; but where the *right* doctors and nurses will ever watch and heal.

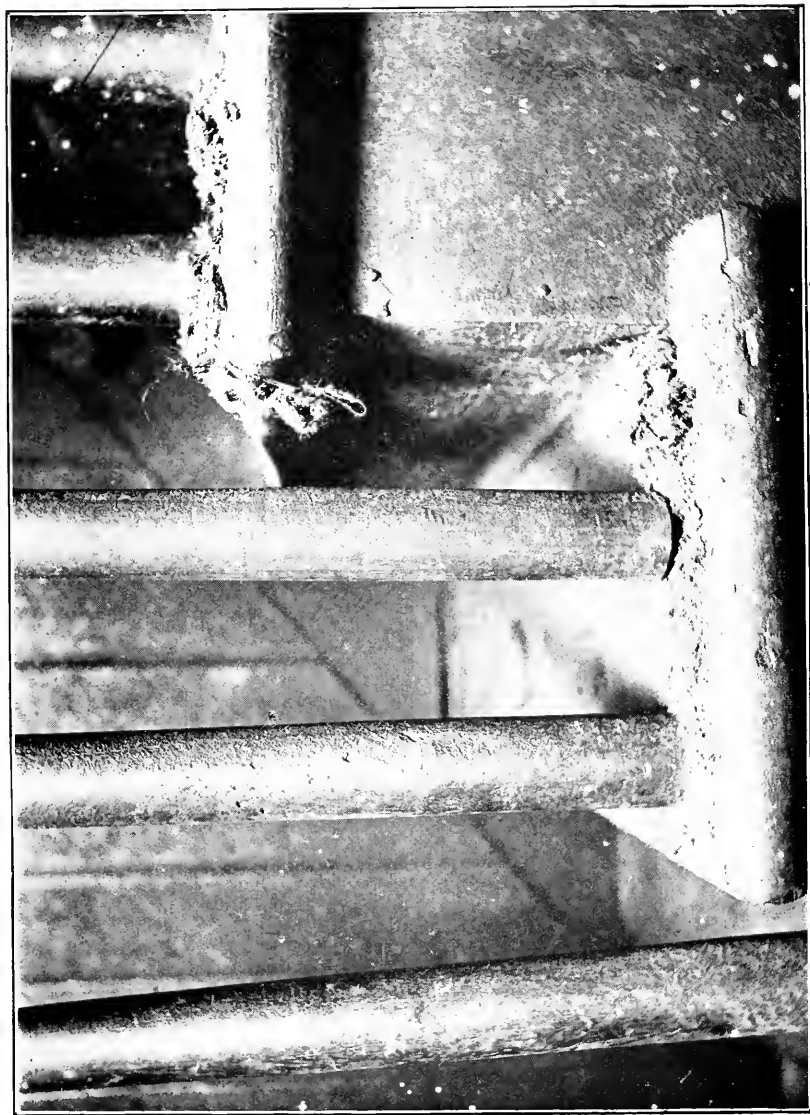
Millions must be spent because it is sound common-sense, because these few millions will save to the city countless mil-

lions more. Dr. Biggs of the Health Department has estimated that the total loss to New York City alone from this Plague is at least twenty-three millions of dollars a year, and that the loss to the United States must be over three hundred and thirty millions. Why? The Plague attacks young men most of all. The average cost to society of a man's bringing up is fifteen hundred dollars. This loan he returns by the labor of his manhood. Multiply this by the thousands of young men who die each year of the Plague in New York alone. To this loss you must add millions more for the care and expense they require from families or friends or the city, in their lingering illness. It costs each patient several hundred dollars to die. And add still more. For, as was recently said, the Plague, because so lingering and hence so costly, because it attacks most often the breadwinner of the family, is "a cause of poverty out of all proportion to its importance as a cause of death." Wives and children are forced on charity lists.

And so each year the expense rolls up into the millions. We are told that five millions wisely used now for great sanatoria, for more dispensaries and diet stations, for more inspectors, would save countless millions to be lost year after year in the future.

What has been spent before has been mostly useless. Four per cent. of the tenement consumptives have gone to hospitals—most of them to die, and for lack of room many have gone into the wards with other patients. This four per cent. has cost the city five hundred thousand a year without proportionate result. "Treble this sum," says Dr. Knopf, "and thousands of lives may be saved annually." Not only will these lives be saved; they will cease to be a menace to others.

The old treatment in the hospitals was as costly as it was useless. In one recent year seventeen hundred and fifty died in the public hospitals of the city. Careful calculation shows that these, if treated in sanatoria, would have cost the city four dollars a week less for each patient. It is the same among children. The need for seaside sanatoria for little children



"THE STAIRWAYS IN THE REAR HOUSE ARE LOW AND NARROW, UNEVEN, AND THICK WITH DUST PILED IN EVERY NOOK AND CORNER."



A GROUP OF "LUNG BLOCK" CHILDREN.

whom the Plague has attacked in other forms—this need is appalling. In such places thousands like Rosalie might have been cured. On the coasts of Germany, France, Italy, Holland, thousands of lives have so been saved. Over here, our Plague-stricken children, if cared for at all, are kept in city hospitals at an expense far greater, with suffering far worse.

Millions must be spent because hundreds of thousands from every class in the city are in constant danger. As Dr. Knopf has said, the patient up and about, attending often to his usual work, but expectorating indiscriminately everywhere from ignorance or carelessness, is the most dangerous of all consumptives. You have heard stories of how the sick struggle on. In laundry, cigar factory, cook shop, fish market; as waiter, as midwife; in scores of callings they have worked on and coughed and worked on still, infecting their fellows and the products of their labor. Of these the sweat-shop work is most dangerous, most potent to spread the Plague to all classes. It is an open fact that most tailors from every class put their work out to be done in the sweat-shop or in the tenement home. The home itself becomes then a sweat-shop.

In a row of fifteen old houses on Cherry Street I found thirty-one little children and eighty-seven women sewing on garments. The garments they sewed were almost all to be worn by young children—the kind you buy in our clothing stores. This row of fifteen houses included the five most deadly Plague strongholds on the block.

This home work shows most clearly what is true in some degree in all other trades—that the Plague-stricken poor must work on to the very end. You have had stories enough. I will add but a scene taken from the written records of a visiting nurse.

The man was dying down in the Ghetto. His cough kept on day and night. It was January. Coal was high. The room at night grew freezing cold. The Plague grew worse. He worked on in bed. He had but one blanket. He used the coats and trousers to cover him. Now consider our tense, rushing, strained city life; remember the scores of your own

friends whose vitality is now at the lowest ebb; and then think of the constant danger to them from a Plague whose victims keep on working, who are constantly in the streets, the cars, and all public places. We all use the products of their work. Only be human and think of these hundreds of thousands, rich and poor alike, in constant danger. Thousands of these will inevitably be taken with the Plague this year, as thousands were taken last year and before. It is for next year, the next, and the next, that I appeal.

Millions must be spent—because we are human. It is my last word. It holds all the rest. I once heard a little chap uptown on his knees at night whispering, "Give us this day our daily bread." He stopped and asked, "How many is us?" From a visiting nurse I heard of another. He was four years old, in a tenement room, and dying. The Plague had gone all through his weak little body. The eyes were blind. And each night, when her half-hour visit was ended, he used to grope for her hand to hold it just a moment, that it might help him bear the long night. This baby might have been saved. He is one cost of delay. The weak groping hand seemed to ask the same question, "How many is us?" And this is the answer:

"I was an hungered and ye gave me meat: I was thirsty, and ye gave me drink: I was a stranger, and ye took me in: naked, and ye clothed me: I was sick, and ye visited me: I was in prison, and ye came unto me. . . . Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me."



APPENDIX 17

THE MANAGEMENT OF CASES OF  
PULMONARY TUBERCULOSIS  
IN THE DISPENSARY

By JAMES ALEXANDER MILLER, A.M., M.D.  
CLINICAL ASSISTANT IN THE VANDERBILT CLINIC  
NEW YORK

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## THE MANAGEMENT OF CASES OF PULMONARY TUBERCULOSIS IN THE DISPENSARY

THE problem which here confronts us is a very familiar one to all who have had any experience in medical dispensary work. It is a very general opinion that these cases of pulmonary tuberculosis are the most discouraging and the most hopeless, as well as the most common, with which the dispensary physician has to deal.

That interest in them should, therefore, be comparatively slight is very natural, and we need not be surprised to find it confined largely to sympathy for their misfortune and curiosity as to their physical signs.

The first thought is to send these patients to the country, and when this is found to be impracticable, their treatment settles into a perfunctory routine, and the patient subsides into the dreary dispensary habit, encouraged only by the hopes arising from a strange optimism.

We are hearing a great deal nowadays of the "Combat with Tuberculosis," and there certainly is a scientific and philanthropic interest in this disease more widespread than at any previous time. Its terrifying prevalence is at least becoming recognized, and the hope of an absolute recovery from it in favorable cases has been better established. Our knowledge of the conditions under which it thrives, and, on the other hand, of the requirements necessary for its prevention and cure, has been widely extended. Results of such increased knowledge must surely follow, and we see them already in

more efficient sanitary legislation, in tenement-house reform, in lectures and circulars for the education of the people, in a constantly increasing number of sanatoria and hospitals for these patients, and in organizations especially designed to investigate and prevent the spread of this disease.

All of this work should be heartily supported and extended as far as possible, and no one can fail to appreciate the enormous importance of sustained efforts in these directions.

In the struggle against tuberculosis there is, however, one weak point in the plan of attack, as it has been thus far developed. This, it appears to me, is the unfortunate state of affairs existing in the dispensaries, in regard to these patients. That the dispensary treatment of these cases in New York City is almost universally unsatisfactory, both to the patients and to the physicians, will, I think, be very generally conceded without further discussion. With two or three exceptions, there is no especial care or attention given to these patients in any dispensary of the city. At the Post-Graduate Hospital an excellent work is being done, the published reports of which give very satisfactory grounds for congratulation on the part of those directly interested in it, and for encouragement to those who may hope for equally good results along similar lines in other institutions. It appears to us, however, that even this most excellent work can be very materially widened in its scope when it is applied to dispensaries in general. We believe that the responsibility of the proper dispensary management of pulmonary tuberculosis should not cease with the marked improvement in health of a selected number of such patients, but should include every patient who applies for treatment, and should extend also to a strict regulation and supervision of the home surroundings and personal habits of all these patients. In this way the spread of this disease may be more effectually checked, and the patient, with all his family, enter into cordial and intelligent co-operation with the efforts which are exerted in his behalf.

Since the beginning of the current year an attempt has been made upon a gradually increasing scale to carry out these

ideas at the Vanderbilt Clinic. It is the object of this communication to describe these efforts in some detail, and to give a preliminary report of the results thus far obtained.

At the very outset it must be understood that we are here dealing solely with those patients who, for one reason or another, are unable to avail themselves of what is generally acknowledged to be the ideal treatment of their disease. We now know this to be an open-air life, in a favorable climate, with freedom from actual physical or mental exertion, an abundance of the most nourishing food, and under the careful supervision of an experienced medical adviser. All of these conditions we find only in a well-conducted sanatorium. Such sanatoria, however, are unfortunately so inadequate in number and in size, and are regulated by such stringent requirements for admission, that we actually find the whole great mass of the tuberculous poor, for whom there is no provision, relying upon the dispensaries for whatever medical attention they may receive.

When this fact is taken into proper consideration, the great importance of making this dispensary treatment as effectual and careful as possible is apparent to all who are interested in the eventual solution of this great tuberculosis problem. That such is not the condition of affairs at present may be gathered from what has already been said, and from the general experience of all physicians active in dispensary work.

It is the aim and purpose of the present movement instituted at the Vanderbilt Clinic, to at least make a beginning in the right direction, and gradually to develop a careful and intelligent system of management of these cases of tuberculosis, until such time when public and private philanthropy shall have provided sufficient sanatoria to accommodate all such patients, and thus relieve us of our responsibility toward them. In spite of the very considerable activity now being directed toward that end, we can not but realize that the prospect of any such happy state of affairs is still very remote. We offer our plan as a practical suggestion to dispensary physicians, in the firm conviction that it is possible so to improve upon our

ordinary methods of management in such cases, that marked results will be shown in the condition of the patients, in the diminished dangers of transmission of the disease, and in the increasing interest afforded to the attending physician. Moreover, we hope to demonstrate that these results may be obtained with very little increased expense on the part of the dispensary, and that, therefore, no available funds will be diverted from the cause of new sanatoria.

We will consider our subject under two main divisions: (1) The treatment of the patient. (2) The inspection and regulation of the homes.

*The Treatment of the Patient.*—After it is decided in each individual case that proper sanatorium or hospital treatment is not practicable, we accept the responsibility of its management, and our general plan is, as far as possible, to adapt sanatorium methods to the conditions existing at home.

A thorough mutual understanding between physician and patient is essential at the very outset, for in no other way can the necessary co-operation be secured.

The patient should be informed of the nature of his disease, and every legitimate encouragement for ultimate recovery should be given him, but never should he be allowed to forget the seriousness of the situation. A false sense of security is very dangerous, but very common among these patients, and especially is this true of the early cases in young people, whose symptoms are so slight that they find it very hard to realize the underlying dangerous possibilities.

Discouragement, even to extreme mental depression, is also very frequent, and the appreciation and proper management of the state of mind in each patient is very essential to their successful treatment. The danger of infection must be carefully explained, but emphasis should be placed upon the fact that all such dangers may be avoided by the proper care of the expectoration. In the Vanderbilt Clinic each patient is supplied with suitable pocket cuspidors, which have been especially devised for our purpose, and they are also given printed circulars of information concerning their disease and the general

principles of its treatment. The important points are explained carefully to each patient, and upon the results of this first talk will, very often, depend what sort of a patient he is to make, and, therefore, the importance of devoting time and thoughtful attention to it cannot be too strongly emphasized.

The actual treatment rests upon four underlying principles: (1) Rest, (2) Fresh Air, (3) Food, (4) Drugs.

The application of these principles to the treatment of tuberculosis in general is too well known to require repetition, but the modifications of them which are necessary in our dispensary dilemma will here be considered.

*Rest.*—Among the people of this class, freedom from physical exertion is unknown and generally is impossible. They must live, and in order to live they must work. This is a proposition which admits of very little argument. Rest, however, is a comparative term, and there is seldom a case in which a great deal more of it may not be introduced into the daily routine than has heretofore been customary. If the disease is in an active stage, it is of the greatest advantage to give the patient at least two weeks of absolute rest, and if there is fever, this rest should be strictly in bed. In other cases, an easy or reclining chair on the fire-escape or roof is a very satisfactory method of obtaining rest in the open air.

The effect of even so short a time as two weeks spent in this way is often remarkable, and is shown by the subsidence of the fever and by the general improvement of the patient; moreover, there are comparatively few patients who are not able and willing to give up this time for that purpose. When the time comes that they must resume work, they are instructed to avoid all unnecessary exertion or exercise, to rest at odd moments whenever possible, and to rest absolutely after working hours. Whenever the character of their work is evidently having an injurious effect, a change of occupation is advised, and, if possible, actual assistance is rendered toward that end. Employment requiring little physical exertion, and preferably in the open air, is the condition desired, and several of our patients have secured positions as watchmen, janitors,

ticket choppers, transfer agents, etc., as the result of our advice. All patients are instructed to rest in the open air as much as possible, to avoid exercise which produces fatigue or shortness of breath, and to spend from eight to ten hours of each twenty-four in bed. When a determined effort is made, it is often possible to effect a very fair "rest cure," even while a patient is engaged in active occupation, and, perhaps, supporting a family.

*Fresh Air.*—Methods of obtaining fresh air in connection with rest have already been mentioned. In addition, the patient should sleep in the lightest and best ventilated room of the home, and, when practicable, he should be its sole occupant. In any case a separate bed is absolutely essential. This bed should be so placed that draughts will be avoided, and the window should be kept open continually, provided that the bed covering is sufficient to keep the patient warm. By means of an inexpensive steamer chair and suitable wraps, the patient may rest out-of-doors, on the roof or fire-escapes, very comfortably, and should sleep there during the summer months. The nearest park should be utilized in favorable weather, as opportunity offers, and all crowded places of amusement or wherever bad ventilation might be expected should be avoided. There is a growing sentiment that the value of any particular climate in the treatment of pulmonary tuberculosis has been greatly exaggerated. While we are not yet disposed to think of New York City as an ideal health resort, nevertheless, the open air even here is certainly beneficial, and we should endeavor to make every possible use of it for these cases. In this connection there is need to protest against indiscriminately sending consumptives to the country, for many localities previously free from this disease have become infected by such patients, who have been ignorant or untrained in the necessary sanitary precautions. No patient should be sent away, unless placed under the direct supervision of a competent physician, until he has demonstrated his willingness and ability to properly respect the health of others.

*Food.*—This aspect of the question is very important but



often very troublesome in our work. Gastric disturbances are such a marked feature of this disease that, even under the best of conditions, proper digestion and assimilation are often difficult to obtain. When to this difficulty is added the inability to pay for proper food, and the wretched cooking of that which is procured, the condition of affairs, as regards many of our patients, is accurately described. Our first object should be to correct any digestive disturbance. Rest is again a valuable aid here, and by careful and judicious regulation of the diet good results may generally be obtained. Much harm is often done by overfeeding before the digestive system is properly prepared for it, and we should carefully and gradually feel our way, until the desired condition of a good appetite and a perfect digestion of a large abundance of food is obtained.

For purposes of superalimentation, milk and raw eggs are the best articles of diet. We gradually accustom our patients to the ingestion of two or three quarts of milk and from six to ten raw eggs every day, in addition to a regular diet of simple food.

The increased expense which this involves is considerable, but many of our patients are able to meet it. How best to supply those patients who are unable to do so for themselves is a question that has occupied a great deal of thought and attention. We have attempted arrangements with the Diet Kitchen and with grocers, by which fresh milk and eggs should be delivered to our patients at reduced rates, but the practical operation of these arrangements has not been satisfactory.

It is our habit at present to report all these cases to the Committee of the Charity Organization Society for the Prevention of Tuberculosis, and up to this time they have been able to supply all such patients according to the necessity existing in each instance. Our experience leads us to believe that this plan will be found more satisfactory than for the dispensary to attempt an independent means of supply for its own patients, and it has the compensating advantage to the Charity Organization Society in the knowledge that their money is being expended under strict medical supervision.

*Drugs.*—Under this heading would be included the greater part of the treatment ordinarily given to tuberculous patients in the dispensary. Under our plan of management, on the contrary, it is considered of the least importance of all, and the majority of our patients receive no medication whatsoever. Cod-liver oil, to be sure, is largely used during the winter months, but is to be regarded more as a valuable form of food than as a drug. Cathartics must be freely prescribed, as constipation is disastrous during the process of overfeeding, but with this exception, the exhibition of drugs should be carefully restricted, and they should only be used to meet specific indications, such as pain, excessive cough, nausea, anæmia, etc. The stomach is rarely in a condition to bear excessive medication, and the promiscuous use of creosote and similar preparations is to be condemned. In general, less harm is done by too little medication than by too much, and if we err at all, it is preferable to do so upon the safer side.

*Inspection and Regulation of the Homes.*—We consider that this portion of our work is quite equal in importance to the care of the patients themselves. Even should there be no apparent improvement in the condition of the patients, we should still maintain that our efforts would be well repaid by the great benefit to the community derived from this work in their homes alone.

The services of a regularly trained nurse are our mainstay for this purpose. Each new case is referred to her, with any special instructions or information that may be thought advisable, and after a thorough inspection of the home a report is made out by her upon printed forms provided for the purpose and submitted to the physician in charge of the case, together with any suggestions which may occur to her as the result of her visit.

Our general plan is to arrange the whole domestic economy to the best interests of the patient and to provide against the dangers of infection to his household and associates. Careful and detailed instructions are given as to ventilation and the principles of the fresh-air treatment, and practical demonstra-

tion is made of the proper method of disinfection of the bed clothing, eating utensils, and personal linen of the patient; also any necessary suggestions are made along the lines of general cleanliness and better hygiene. Thorough inquiry is made concerning the care which the patient habitually takes of his expectoration, and notice taken of the general attitude of the whole household toward the instructions given at the clinic. Carelessness is reprimanded, misunderstandings corrected, and a cordial spirit of co-operation is requested and almost invariably obtained. The daily habits of the patient, the duration and character of his work, his rest, his exercises, and his sleep, with the effects of each upon his condition, are ascertained and noted. General destitution, as well as any especial need, is reported, and the attention of a suitable charitable society or institution is directed to it. Particular information is obtained in regard to the patient's diet, his appetite, and the nature and cooking of his food. Many digestive disturbances which had taxed the ingenuity and efforts of the physician, are often corrected by a few practical suggestions from the nurse. Investigation is made into the available facilities for taking a "rest cure" out-of-doors, and the fire-escape, the roof, and the nearest park are all considered from this point of view, and the results incorporated in the report. Sometimes the "home" appears entirely unsuited for our purpose. This may be due to lack of sufficient light or air, to dampness or filth, or because of the distance from the place of work. Under these circumstances, a change is advised and frequently effected, even if aid from the Charity Organization Society or elsewhere is necessary for the purpose. Other members of the household who have coughs, or otherwise excite suspicion, are sent to the clinic for examination, and thus many cases come under our treatment much earlier than would otherwise have been the case. The nurse is also of great assistance to the physician in her endeavors to explain to these patients and their associates just how great and in what particulars lies the danger of infection to others. The facts must be stated strongly enough really to frighten them from care-

lessness in regard to their expectoration, but it must be just as strongly emphasized that the freedom from danger is absolute when proper care is uniformly exercised. It would be a most unfortunate consequence of our efforts should our patients be shunned as outcasts by their associates, and both from this misfortune, and from the dangers of infection, we hope to save them and their friends, through their accurate knowledge of the subject. By frequent inspections a general supervision is maintained and assurance is given that the instructions given by the physician are carefully followed. How necessary this is among the class of people with whom we are dealing is a matter of common knowledge.

This cursory review of the part performed by the nurse in our general scheme needs little discussion to demonstrate its value. It is certainly true that a woman, trained in nursing, who has the energy, interest, and ability necessary for this kind of work, can do much more than any physician toward ascertaining the exact condition of affairs and correcting the evils existing in these homes. In no other way could this work be at all complete or satisfactory to the physician, to the patient, or to the community, and that these patients themselves appreciate this fact is evidenced by the warm reception given to our nurse, as a friend and welcome visitor in their homes. We, therefore, consider that she is an indispensable factor in the correct solution of this problem, and as a result of her efforts we can at least say, that each case thus visited is converted from a dangerous focus of infection into a source of accurate and intelligent knowledge in regard to this disease.

Although, as has been elsewhere said, the success of this work is by no means to be measured safely by the percentage of cases which improve or are actually cured, nevertheless it may be of interest to know something of the results thus far obtained as shown by the condition of the patients themselves.

During the months of January, February, and March, the plan of management of cases of pulmonary tuberculosis which has been above described was systematically carried out in one of the medical rooms of the Vanderbilt Clinic, representing

one-eighth of the total number of patients who applied for treatment in the department of General Medicine. In this room, during these three months, there were forty-six cases of pulmonary tuberculosis. Eleven of the patients were seen at the clinic only once, and are, therefore, not included in this report. There remain thirty-five cases in which we have had an opportunity to judge of any results of treatment, and these may be classified according to the stage of their disease into: early cases, eight; moderately advanced cases, six; advanced cases, twenty-one.

Of the total number, twenty-two patients have increased in weight, ten have lost weight, and three have shown no change. The average increase per patient in those who have gained weight, is four pounds. The average loss per patient in those losing weight is two and three-quarter pounds. The greatest gain in any one patient is twelve pounds, and the greatest loss is five pounds.

Of the twenty-two patients who gained in weight, seven were early cases, five were moderately advanced, and ten were advanced cases.

Of the ten who lost weight, all were advanced cases and the three cases in which the weight remained stationary represented equally the three stages of the disease. Expressed in percentages, we find improvement in 63 per cent of all our cases, in 87 per cent of the early cases, in 83 per cent of the moderately advanced cases, and in 47 per cent of the advanced cases. In regard to the use of the body weight as an indication of the progress of this disease, it can only be said that this factor is generally regarded to be the best single criterion, and that, while many other conditions must, of course, be considered, the limits of this report render their exclusion necessary at this time. It may be stated, however, that, as far as we are able to judge from the clinical manifestations, the changes in body weight furnish a very honest expression of the general condition of these patients.

This incomplete report does not attempt to be in any degree conclusive, because of the small number of cases and of the

short time that they have been under observation. Nevertheless, it must be admitted that these results afford encouragement to us in the further prosecution of this work, and they are only presented here in order to demonstrate that our plans are not entirely idealistic or impracticable, and to stimulate, if possible, a greater interest in these cases upon the part of others.

The object of this communication has been accomplished if it directs attention from the physicians active in dispensary work to the problems which are here considered. Although the work in itself is comparatively inconsiderable, we feel that it is a good beginning in a somewhat neglected field, and if all the dispensaries in the city should be aroused to a similar interest and activity, we would immediately have a tremendous force applied to the solution of the tuberculous problem and one that is not dependent upon large public subscriptions for its execution.

The writer wishes to express his sense of deep obligation to Dr. Edward L. Trudeau, to whom is due his especial interest in this whole subject, and to Prof. Walter B. James, without whose invaluable co-operation and generous support this particular work would have been impossible.

APPENDIX 18

INSTITUTIONS WHERE TUBERCULOUS  
PATIENTS MAY RECEIVE TREATMENT  
IN NEW YORK AND VICINITY

By CHARLES H. JOHNSON





## INSTITUTIONS WHERE TUBERCULOUS PATIENTS MAY RECEIVE TREATMENT IN NEW YORK AND VICINITY

THERE is a growing tendency, which is fast becoming a rule, that the general hospitals of New York City will not receive patients suffering from tuberculosis. It becomes, therefore, necessary for those who desire treatment to resort to some special institution. The following list will show the number of such places where a tuberculous patient may go, and it will be evident also that the number of institutions to which a person in poor circumstances, with perhaps others dependent on his exertions, can go and receive the necessary treatment at a very moderate rate or free, is woefully inadequate.

*Phthisis Hospital on Blackwell's Island*, conducted by the Department of Charities. This hospital was opened February 1, 1902, and the buildings are a part of the plant formerly occupied by the Manhattan State Hospital. Several changes were made to make them meet the new requirements, and patients from Bellevue and Allied Hospitals and other city institutions were removed to it. An attempt is made at segregating the various stages of the disease, there being four classes and all in separate wards. From the very start the applications for admission have been numerous, as many as eleven in a day for a period of two weeks. There are accommodations for 190 male and 100 female patients, and on September 1, 1903, the enrolment showed the names of 334 males and 82 females. The reason for the lesser number of female patients is not a lack of female sufferers from consumption requiring care, but an unwillingness on the part of women to go to the Island.

*Seton Hospital* is situated on Spuyten Duyvil Parkway, within twenty-five minutes' walk of the New York Central Station. It was opened in January, 1895, and was founded by the late Sister Mary Irene, one of the Sisters of Charity. In 1896, the Board of Health of New York City assumed the cost of maintenance in the hospital of a large number of cases of pulmonary tuberculosis, and this enabled the institution to extend its usefulness to a point which its financial condition had not hitherto warranted, while it also resulted in a change of the former policy of receiving only curable cases. This arrangement continued, however, only for a brief period, and since then patients have been accepted as city charges by the Department of Public Charities. Private patients are now rare, as there is little accommodation for such patients. On September 1, 1903, the census of the hospital showed 188 men and 18 women. The building stands on an eminence overlooking the Hudson and contains all the modern appliances for sanitation, one of its chief attractions being a large solarium, filled with growing plants, where, in cold or stormy weather, the patients delight to congregate. Sister Francis Ignatius is the Sister Superior. Applications for the admission of free patients must be made to Mr. E. F. Merwin, Superintendent of Outdoor Poor, at the foot of East Twenty-sixth Street.

*St. Joseph's Hospital for Consumptives* is owned and conducted by the Sisters of St. Francis. It occupies an entire block in the city of New York, bounded by St. Anne and Brooks Avenues and 143d and 144th Streets. It contains 300 beds, nearly all of which are entirely free and constantly occupied by the sick poor, who are admitted irrespective of creed, race, or nationality. In winter the hospital is very much crowded, and the better cases are sent away to make room for the weaker ones. It is always necessary to put up extra beds in the winter. There have never been so many cases as last winter—375—when two new rooms had to be fitted up in the yard. Most of the patients are advanced cases, but patients in every stage of the disease are taken.

There are a few private rooms and small wards where the charge is from \$5 to \$10 per week. Sister Liguori is the Sister Superior.

*The Lincoln Hospital and Home of the City of New York*, 141st Street and Concord Avenue, maintains a separate building for free and pay consumptive patients. Of the forty beds available for consumptives but twenty-nine were occupied on September 1st, mostly by free patients, the majority being patients received from the Department of Charities.

*Riverside Hospital* on North Brother Island was used during the summer of 1903 by the Department of Health as a tuberculosis hospital, the largest number cared for at any one time being eighty. The number in the hospital on September 1st had been reduced to about twenty, but the Department intends to resume the care of tuberculous patients on a larger scale, as it is believed that there is need for a hospital where, if necessary, there may be forcibly detained such patients as appear to be a danger to the community through refusal to go to hospitals or on account of persistent neglect in the necessary precautions against infecting others.

June marked the beginning of the third year of tent treatment of special classes of the insane at *Manhattan State Hospital East*, Ward's Island. On September 1st there were eighty-seven beds available for women and forty-three for men, the solarium and two adjacent wards being used by the women, the male patients being cared for in the tents.

Open-air treatment of consumptives has of course been tried elsewhere, but this was its first adoption by a hospital for the insane, and is said also to be the first instance of a continuous system of tent treatment anywhere. The results have been so encouraging that steps have been taken to introduce the same system in other New York State hospitals, as well as in the Ohio State Hospital at Columbus, the Protestant Hospital for the Insane at Montreal, the Vermont State Hospital at Waterbury, the Eastern Maine Hospital at Bangor, and elsewhere.

*The House of Rest for Consumptives*, for a period of about

ten years prior to January, 1902, housed its beneficiaries at St. Luke's Hospital, where it had upward of sixty patients at a time. At the close of that year the hospital authorities concluded that they needed more room for their own use and decided not to renew the arrangement. The House of Rest, therefore, purchased the Macdonough and Kidwell residences at Inwood, on Bolton Road between 209th and 210th Streets. When necessary alterations are made, there will be accommodations for about forty patients, although on the 1st of last September there were but twelve patients there, owing to the fact that the women's building was not then ready for occupancy. Other patients are, however, supported by the home in various other places. While the object of the House of Rest has been to be a refuge for incurable consumptives, it does not confine itself exclusively to the care of advanced cases.

*The Home for Incurables* on Third Avenue between 180th and 183d Streets receives in single rooms a few consumptives, most of whom are pay patients. Out of a total of 275 in this institution on September 1st, seven were cases of tuberculosis, and this is about the proportion usually maintained.

*The Brooklyn Home for Consumptives*, situated on Kingston Avenue, began its work over twenty years ago and has not hesitated to take in patients who are in an advanced stage of the disease. It is supported by the different churches in Brooklyn and is managed by a board of representatives from these churches. The Home, which has a capacity for 118 patients, had on the 1st of September ninety-two patients.

Mention of the excellent work of the *United Hebrew Charities* may not be out of order here, for while that organization does not belong to the class of institutions here enumerated, still it has done such effective work through its Committee on Tuberculosis in visiting and relieving its consumptive poor and in persuading many to make use of such hospitals and sanatoria facilities as are available, that it is in truth one of the most effective institutions in the city in the combat of tuberculosis as a disease of the masses. To quote from a recent report of that Committee:

“The methods made use of by the Committee may be classified under the following general headings:

“(A) The placing of applicants in charge of a special agent.

“(B) Careful medical examination to secure a correct diagnosis.

“(C) Instruction of consumptives by means of pamphlets, tracts, etc., and, in particular, by verbal guidance, with special reference to the disposal of sputum, cleanliness of person and home, proper diet and exercise, cessation of unhealthy occupation, removal to more sanitary neighborhood, and, in general, following out the recommendation of the Board of Health.

“(D) Securing the most desirable medical treatment; where possible, in sanatoria.

“(E) Supplying necessary food, such as eggs, meat, etc., in sufficient quantities, and, in particular, an abundant supply of good milk.

“(F) Where change of climate was indicated by the medical examination, granting transportation to points desired.

“(G) Securing particularly for the improved consumptive outdoor work, and, where possible, positions in country towns.

“(H) Friendly visiting.”

*Adirondack Cottage Sanitarium* was opened for patients February 1, 1885. It is situated on the side of a wooded mountain near Saranac Lake village, nearly two thousand feet above sea level. It was the first institution of its kind for the treatment of consumption in this country. It started on a small scale, with accommodations for only nine persons; it now has a capacity for 106 patients. It consists of a main building and grouped around this are eighteen small cottages and an open-air pavilion, built for the purpose of affording pleasure and recreation to the patients during stormy weather.

The Sanitarium accepts only those who are in the first stages of consumption or convalescing from other pulmonary diseases, or, in the opinion of the examining physician, are likely to be benefited by the Sanitarium treatment.

Its purpose is to offer to persons in this condition, who otherwise could not afford the expense of a stay in the moun-

tains, the benefits to be derived from a change of climate, a well-regulated out-of-door life amidst hygienic surroundings, a nourishing diet, and the latest and most approved methods of medical treatment. The Sanitarium offers such an opportunity at a most moderate cost of \$5 a week, which barely covers the necessary expenses for table.

Dr. E. L. Trudeau is in charge, and Dr. Alfred L. Loomis of New York City is the examining physician. There is a free-bed fund which has maintained twenty-one patients. In addition, twenty-five patients have been supported by charitable individuals. At present the number of patients is one hundred and six—the full capacity—with a waiting list of from twenty to thirty.

*The Loomis Sanitarium*, named for the founder of the institution, Dr. Alfred L. Loomis, who died before the project was far advanced, is situated about three and one half hours from New York City. It is two and one-half miles from the village of Liberty, in Sullivan County. The elevation is 2300 feet above the sea level, the winters being cold, dry, and exhilarating, the summers cool and refreshing.

The Sanitarium opened in June, 1896, with one trained nurse, and before six months had passed it was found necessary largely to increase the force. A school for nurses was started in 1898, and its pupils have, to a considerable extent, been drawn from the convalescents.

It is the purpose of the Sanitarium to admit only incipient or moderately advanced cases, and the basis of treatment has been climatic and hygienic. It was the first institution in the country to utilize the X-ray for purposes of diagnosis in pulmonary diseases. Charges of \$12, \$15, and \$20 per week are made. The Sanitarium has examiners in all the large cities who pass upon the patients before they are accepted, Dr. Henry P. Loomis being examiner for New York City.

There are at present about fifty patients. No free patients are taken at Liberty. It is stated that there has never been any effort made on the part of the managers of this institution to make any profit on it, but everything has been calculated

so as to make it merely self-supporting, if possible. There is a charitable annex, which has now thirty patients at a rate of \$5 a week, including everything except medicines. The amount paid for medicines varies greatly with the condition of the individual patient. This reduced rate does not cover the expenses of the annex and it has had to have outside aid to carry on its work. There are many more applications than the annex can accept. Up to a recent date there was a New York branch of the Loomis Sanitarium which cared for those who had passed the incipient stage and were considered among the incurable. It did a very good work. It always had a long waiting list, and as many as eight have been refused in one week. It also conducted a dispensary, which gave much valuable and timely advice. The branch with the dispensary has been discontinued, however, and is, therefore, no longer available as a refuge for this class of sufferers.

*Montefiore Country Sanitarium.*—Memorial Day, 1901, was the opening day of the new building of this institution. The Country Sanitarium, however, came into existence some years previous to that event, as a result of the repeated observations that the proportion of consumptives among the sufferers treated in the Montefiore Home for Chronic Invalids was very large. In 1895, the project was started by Mr. Lyman G. Bloomingdale and heartily supported by Mr. Jacob H. Schiff. The Sanitarium was opened in 1897 with ten cases of incipient consumption. In 1898, a pavilion was built for twenty-four additional patients, and in May, 1901, the present new buildings were opened. The construction of the buildings was supervised by Dr. S. A. Knopf. They are at Bedford Station, Westchester County, N. Y., on an elevation overlooking a beautiful valley. There is a farm of 136 acres, on which patients do light outdoor work.

Efforts have been made to confine the number of patients to those in the incipient stages of the disease, although no extreme line is drawn. At the time of its dedication this was the only free sanitarium for consumptives in the United States. On September 1, 1903, there were 160 patients in the Sani-

tarium, with room for 162. Partially cured patients are constantly being sent home from the Sanitarium, and this explains the fact that the institution is not filled to its very limit. At the Home, situated on Broadway, 138th and 139th Streets, there is a special ward for advanced cases of tuberculosis. At present the ward has twenty-eight patients and a long waiting list. The officials say there is an appalling number of applications for admission of advanced cases.

*Stony Wold Sanatorium* at Lake Kushaqua, Franklin County, N. Y., was opened on August 15th of this year. It is primarily intended for working girls suffering from incipient lung trouble, and is able to accommodate sixty patients, the census of September 1st showing twenty-three patients under treatment.

*Sanatorium Gabriels*, belonging to the Sisters of Mercy, at Gabriels near Paul Smith's Station in the Adirondacks, receives incipient cases of tuberculosis and has accommodations for about eighty patients in the summer and sixty patients in the winter.

On the 1st of September there were seventy-five patients, of whom, in accordance with the policy of the hospital, there was one free patient to each ten patients who paid.

The *Working Girls' Vacation Society* maintains at Santa Clara, Franklin County, N. Y., vacation houses which are somewhat on the order of sanatoria. Admission to these houses is for respectable unmarried working girls with consumptive tendencies, who have satisfactory recommendations and certificates from physicians that a vacation is needed. The Society provides a two weeks' vacation at these houses, including railroad fares, at \$4 a week; for girls who are unable to pay the full board, the nominal sum of \$1.50 per week is charged.

*State Hospital for the Treatment of Incipient Pulmonary Tuberculosis*.—This hospital, situated at Raybrook, Franklin County, about four miles east of Saranac Lake in the Adirondacks, is now nearing completion and will probably be opened in February, 1904. It is intended for those suffering from the first stages only of consumption, and while it will receive pay patients when there is room for them, by its charter it is com-



pelled to give preference to the indigent. Medical examiners for the Hospital will be appointed in the various cities of the state, and only such persons as have lived in the state at least one year and who have received proper certificates from these examiners may be admitted.

In going from one institution of this character to another, the same depressing answer is received in each place—multitudes of applicants and very few accommodations. “We could fill a thousand rooms if we had them,” said a physician connected with a tuberculosis sanitarium. It is not at all surprising that it is so. It has been estimated that, including the accommodations which general hospitals, homes, and sanatoria afford, there are accommodations for about one thousand consumptives in the city. But what is such provision in the face of thousands suffering with the disease! In 1902, over eleven per cent of the deaths in New York City were due to phthisis. There were 7571 deaths from phthisis in Greater New York in the year 1902, and of this number 4894 were in the boroughs of Manhattan and the Bronx. In the same year there were 12,914 cases of tuberculosis reported, and 9722 were in the two boroughs mentioned above. A mere glance at these figures reveals the inadequacy of facilities for the treatment of this large class of sufferers. The disease is especially prevalent among the class who are not able to lay aside their business and go to mountains or health resorts. Thousands are suffering from consumption who are compelled to remain at their daily work, often, perhaps, a work most uncongenial to their disease, because of their dependency upon their daily wage for the support of themselves and their families. The value of sanatorium treatment for consumptives is beyond question, and therefore the necessity of public sanatoria and sanatoria where the sick may be cared for at rates which make them accessible to the many is imperative.



APPENDIX 19

SANATORIA AND HOSPITALS FOR CON-  
SUMPTIVES IN THE UNITED STATES  
AND CANADA: A PARTIAL LIST

COLLECTED BY S. A. KNOPF, M.D.



SANATORIA AND HOSPITALS FOR CONSUMPTIVES IN THE UNITED STATES AND CANADA: A PARTIAL LIST

- California: Esperanza Sanatorium, Altadena.  
Idyllwild Sanatorium, Idyllwild.  
Ballard Pulmonary Sanatorium, Pasadena.
- Colorado: National Jewish Hospital for Consumptives, Denver.  
The Home, Denver.  
The Nordrach Ranch, Colorado Springs.  
Colorado Sanatorium, Pueblo.  
Resthaven, Lillian Garthwaite-Wylie Memorial for Convalescing Consumptives, Sunrise Mountain, Morrison.
- Connecticut: Dr. Brooks's Sanatorium, New Canaan.
- Illinois: Cook County Hospital for Consumptives, Dunning.  
St. Ann Sanatorium for Consumptives, West 48th Street, Chicago.  
The Alexian Brothers' Hospital—Consumptive Ward, Chicago.  
St. Elizabeth Hospital, Chicago.
- Iowa: Boulder Lodge Sanatorium, Fort Dodge.
- Louisiana: Dr. G. R. Tolson's Private Sanatorium, Covington.
- Maryland: Hospital for Consumptives, Towson.
- Massachusetts: Sharon Sanatorium, Sharon.  
House of the Good Samaritan, Boston.  
Massachusetts State Hospital, Rutland.  
The Millett Sanatorium, East Bridgewater.  
Channing Home, Boston.  
Free Home for Consumptives, Quincy Street, Boston.  
Cullis Home for Consumptives, Boston.
- Minnesota: Special Hospital for Tuberculous Prisoners, Minneapolis.
- Mississippi: Special Hospital for Tuberculous Insane, Jackson.
- Missouri: Mount St. Rose Sanatorium, St. Louis.
- New Mexico: St. Joseph's Sanatorium, Silver City.  
General Hospital, Fort Bayard.

United States Public Health and Marine Hospital Service  
 Sanatorium, Capitan.  
 New York: Adirondack Cottage Sanatorium, Saranac Lake.  
 Sanatorium Gabriels, Paul Smith's.  
 Home for Consumptives, Brooklyn.  
 The Loomis Sanatorium, Liberty.  
 Manhattan State Hospital East, Ward's Island.  
 Montefiore Home Country Sanitarium, Bedford Station.  
 St. Joseph's Hospital for Consumptives, New York City.  
 Seton Hospital, Spuyten Duyvil.  
 Tuberculosis Infirmary, Blackwell's Island.  
 Riverside Sanatorium, North Brother Island.  
 Stony Wold Sanatorium, Lake Kushaqua, Franklin  
 County.  
 Clinton Prison, Dannemora. Separate building for tuber-  
 culous prisoners.  
 House of Rest for Consumptives, Bolton Road and 209th  
 Street.  
 Montefiore Home, Broadway and 138th Street.  
 Home for Incurables, Third Avenue and 180th Street.  
 Kings County Hospital Infirmary.  
 Hill Crest, Santa Clara, Franklin County. (Summer  
 months only.)  
 The Edgemont, Liberty.  
 Tent Colony of Dr. Stubbett, Liberty.  
 Prescott Reception Cottage, Saranac Lake.  
 North Carolina: Pineshire Sanitarium, Southern Pines.  
 Winyah Sanitarium, Asheville.  
 St. Joseph's Retreat, Asheville.  
 North Dakota: Oak Park Sanatorium for Consumptives, Minot.  
 Ohio: Municipal Tuberculosis Sanatorium, Cleveland.  
 Cincinnati Branch Hospital for Consumptives, Cincinnati.  
 Pennsylvania: Free Hospital for Poor Consumptives, White  
 Haven.  
 Home for Consumptives, Philadelphia.  
 Scranton Sanatorium, Scranton.  
 Rush Hospital, Philadelphia.

Chestnut Hill Hospital, Philadelphia.

Nott Home of Jewish Hospital, Philadelphia.

Texas: Camp Reliance, Comfort.

Dr. L. W. Cook's Sanatorium, Boerne.

Canada: Free Home for Consumptives, Gravenhurst, Ontario.

Muskoka Cottage Sanatorium, Gravenhurst, Ontario.

Montreal Sanatorium for Consumptives, Montreal, Quebec.

This list, incomplete though it may be, is inserted because the mere names and addresses may prove of use. A directory aiming to give a comprehensive view of all the work being done in the United States and Canada for the relief and prevention of tuberculosis is in preparation by this Committee.





APPENDIX 20

A BRIEF LIST OF IMPORTANT WORKS  
IN REGARD TO TUBERCULOSIS

SELECTED BY S. A. KNOPF, M.D.



A BRIEF LIST OF IMPORTANT WORKS IN  
REGARD TO TUBERCULOSIS

ENGLISH

- Brush, E. F.**, Human and Bovine Tuberculosis.
- Buckley, J. M.**, A Hereditary Consumptive's Successful Battle for Life.
- Campbell, Harry**, Respiratory Exercises in the Treatment of Disease.
- Chapin, Chas. V.**, Municipal Sanitation in the United States.
- Checkley, Edwin**, A Natural Method of Physical Training.
- Ciccolina, S. M. A.**, Deep Breathing.
- Davis, N. S., Jr.**, Consumption, How to Prevent it and How to Live with it.
- Delafield and Stillman**, A Manual of Physical Diagnosis.
- Denison, Charles**, Climates of the United States.
- Denison, Charles**, Exercise and Food for Pulmonary Invalids.
- Densmore, Emmett**, Consumption and Chronic Diseases.
- Densmore, Helen**, How Nature Cures.
- Evans, Geo. A.**, Historical and Geographical Phthisiology.
- Flick, Lawrence F.**, Consumption, Preventable and Curable.
- Funk & Wagnalls Co.**, The Prevention of Disease. Vols. I. and II.
- Goodwin, Chas. H.**, Treatment of Diseases of the Heart and Lungs.
- Hayes, J. R.**, How to Live Longer and Why we do not Live Longer.
- Hillier, Alfred**, Tuberculosis: Its Nature, Prevention, and Treatment.
- Hunter, Robert**, Tenement Conditions in Chicago.

- Knopf, S. A.**, Pulmonary Tuberculosis: Its Modern Prophylaxis and the Treatment in Special Institutions and at Home.
- Knopf, S. A.**, Tuberculosis as a Disease of the Masses and How to Combat it.
- Knopf, S. A.**, Tuberculosis: Diagnosis, Prognosis, Prophylaxis, and Treatment (Twentieth Century Practice of Medicine, Vols. XX. and XXI.).
- Lake, Richard**, Laryngeal Phthisis.
- Latham, Arthur**, Diagnosis and Modern Treatment of Pulmonary Consumption.
- Loomis, Alfred L.**, Physical Diagnosis.
- Lucas, Joseph J. S.**, Nordrach at Home.
- McCoy, John**, Consumption, How to Prevent it and How to Cure it.
- Mays, Thomas J.**, Consumption, Pneumonia, and their Allies.
- Mays, Thomas J.**, Pulmonary Consumption, a Nervous Disease.
- New York City Board of Health**, Report to Mayor Strong in Relation to Pulmonary Tuberculosis, 1897.
- Paget, Stephen**, Surgery of the Chest.
- Philip, R. W.**, Pulmonary Tuberculosis.
- Philip, R. W.**, A Thousand Cases of Pulmonary Tuberculosis.
- Reinhardt, Ch.**, and **Thomson, David**, Open-air Treatment and Life in an Open-air Sanatorium.
- Solly, S. E.**, Medical Climatology.
- Squire, J. Edward**, The Hygienic Prevention of Consumption.
- Steell, Graham**, The Physical Signs of Pulmonary Disease.
- Tussey, A. Edgar**, High Altitudes for Consumptives.
- Tyson, James**, Physical Diagnosis.
- Walters, F. R.**, Sanatoria for Consumptives.
- Weber, Hermann**, Chronic Pulmonary Phthisis.
- Wide, Anders**, Handbook of Medical and Orthopedic Gymnastics.
- Williams, F. H.**, The Roentgen Rays in Medicine and Surgery.
- Ziemssen, H. von**, Pulmonary Tuberculosis: Its Etiology, Symptomatology and Therapeutics.

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*The British Sanatoria Annual*, London, 1901.

*Transactions of the British Congress on Tuberculosis*, vols. i., ii., iii., and iv.

*The Canada Lancet*, Tuberculosis Number, December, 1901.  
*American Congress of Tuberculosis Bulletin*, vol. i., part i., 1900.  
*The Journal of Tuberculosis*, Asheville, N. C.  
*Tuberculosis*, Journal of National Association for Prevention of  
 Consumption, London, England.

#### FRENCH

**Artault de Vevey, S.**, Tuberculose et Injections Huileuses.  
**Barbier, Henry**, Sémiologie Pratique des Poumons.  
**Baréty, A.**, Du Climat de Nice.  
**Barth, H.**, Thérapeutique de la Tuberculose.  
**Beaulavon, Paul**, La Phthisie: Hygiène—Cure—Guérison.  
**Beaulavon, Paul**, La Tuberculose Pulmonaire dans les Sanatoria.  
**Bernardeau, E.**, Histoire de la Phthisie Pulmonaire.  
**Bouloumié, P.**, Les Maladies Évitable.  
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**Chauvain, L.**, Pour se Defendre contre la Tuberculose Pulmonaire.  
**Chquet, A.**, L'Hygiène des Tuberculeux.  
**Comte de Goyan**, Des Indications Thérapeutiques du Régime  
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**Grancher, J.**, Maladies de l'Appareil Respiratoire.  
**Grillot, Henry**, Le Sanatorium Français.  
**Hameau, G.**, Le Climat d'Arcachon et le Sanatorium.  
**Hérard, Cornil et Hanot**, La Phthisie Pulmonaire.  
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 Pulmonaire.  
**Knopf, S. A.**, Les Sanatoria, Traitement et Prophylaxie de la  
 Tuberculose Pulmonaire.

- Knopf, S. A.**, La Tuberculose Considerée comme Maladie du Peuple, des Moyens de la Combattre.
- Küss, Georges**, De l'Hérédité Parasitaire de la Tuberculose Humaine.
- Lalesque, F.**, Cure Marine de la Phthisie Pulmonaire.
- Leroux, Charles**, Les Hôpitaux Marins.
- Letulle, M.**, La Croisade contre la Tuberculose (Presse Médicale).
- Letulle, M.**, Le Sanatorium Populaire Idéal.
- Petit, E. P. Léon**, Le Phthisique et son Traitement Hygiénique.
- Pujade, P.**, La Cure Pratique de la Tuberculose.
- Ribard, Elisée**, La Tuberculose est Curable.
- Sabourin, Ch.**, Traitement Rationnel de la Phthisie.
- Santa, Pietra**, Traitement Rationnel de la Phthisie Pulmonaire.
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- Teissier, Pierre**, Des Lésions de l'Endocarde chez les Tuberculeux.
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- Triboulet et Mathieu**, L'Alcool et l'Alcoolisme.
- Weber, Hermann**, Climatothérapie.

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- La Tuberculose Infantile.*
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- Cornet, G.**, Die Tuberkulose.
- Dettweiler, P.**, Die Behandlung der Lungenschwindsucht in geschlossenen Heilanstalten.
- Flügge, C.**, Dr. Brehmer's Heilanstalt für Lungenkranke (1890).
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